

Henry Selden
Pogolke

Sold by J. G. Auer, No. 543 Market Street.

10
An Essay
on the
Essence of
the
Essence

Albert & Senae in epistolae
intermedietas

Subscribit a the immutabilem
intermedietas



An Essay
on
The Typhus
for the
Degree of Doctor of Medicine in the
University of Pennsylvania
by Henry Selden
of the city of Norfolk & state of Virginia
Philadelphia — — 183

The above is the form of the title page of
the thesis. It must be rewritten on thesis paper

Dr Gibson is of opinion that an operation should never
be performed for a malignant tumour of the parotid gland
because it is impossible to remove the gland entirely & the
disease returns & progresses with greater rapidity than
before, generally causing the death of the patient in a short
time whereas without the operation he might have lived
many years. Many cases have been reported of successful
operations. They have been apparently successful at first but
the disease has always returned & in most cases terminated
fatally in a short time. He is supported in this opinion by
Sir A Cooper, Mr Carmichael of Dublin, Dr Saml. Cooper R.N.
Liston, Dr Mott of N York & Dr Warren of Boston. They have all
attempted the removal of such tumours but without success
where the conglobate gland only is affected & this is not wedged
into all the crevices of the cranium the operation will generally
be successful. He saw Mr John Bell about thirty years ago
commence an operation for a tumour of this kind in a young man in
Edinburgh. as soon as he perceived the nature of the tumour
he closed the wound & advised him to let no one meddle with it
& the patient is now living. Dr G met him in Edinburgh. If the
tumour had been removed the patient would probably have died
shortly after.

Dr Gibson saw in England a child that had been completely cured
of prolapus of the tongue without an operation. The plan pursued by
a Corp who had charge of the case was to press the tongue gradually
to the mouth by compression. He kept the mouth closed

by means of a spring which passed over the head & under the
chin & had a screw, which ~~the~~^{the} spring was shortened & the
mouth more tightly closed as the tongue decreased in size.
It was as first necessary to keep the tongue in by means of a
bandage
+ Although Dr. Wilson insists that the parotid cannot be removed
by an operation, yet many surgeons in Philadelphia say that it
can. Dr. Randolph interprets the gland in the presence of Dr. Har-
ner Dr. Johnston & others, Dr. Horner said that the lobe was
removed, Dr. Johnston was of the same opinion. Dr. McCallum
says that he has succeeded in effecting its removal several
times. Dr. Wilson has formed his opinion from experiments on
the dead subject with lachrym glands, that although the lachrym
gland ~~the~~^{the} engages present of the cutaneous ~~the~~^{the}
gland ~~the~~^{the} adheres so firmly that it cannot be separated; the ~~the~~^{the} gland
does not present the same difficulty, for by its
increase in size & weight the parotid for a period drawn out
the operation is thus greatly facilitated.

Gift - Cited of
R. C. Hughes, M.D.
3/1/64

22022.3 0 2 March 17, 1964

The creative forces of power is dependent of matter
upon which vital phenomena depend, acting
upon matter & producing the phenomena
as the phenomena of electricity &c depend upon
the properties of matter. All organic beings
originate in an ovum or egg, both vegetable
& animal; egg consists of nucleated matter
irresistible & capable of assuming an organized
form, ~~surround~~ an envelope of membrane (ovic-
lode), contains it & within is a vesicle bearing a
germinal spot. The female contains and with
ovaries where formation is effected. The
ova (Ova - Ovace, granules & germinal vesicles
with a germinal spot. This is the ovacium
is contained in another vesicle, the ovum
before fecundation has a vitellus - the vitality
of the ovum & is separate matter. It
cannot itself produce an individual it
is not capable of a separate existence.
Now the fecundation process is applied to the

Notes on Dr Jackson's lectures

delivered during Septem 1839-40

Life is a succession of changes, affecting
The phenomena of life are divided into two classes
1st ~~those~~ ~~which act within us~~ as the mental

phenomena which are peculiar to animals
as sensibility ^{which constitute animal life} consciousness & volition, 2^d

the phenomena of vegetative life common to vegetables
& animals, The brain is the centre of the nervous

system, Life is a unit & there are two spheres
^{the cerebrospinal cord in which resides}

of life, Sensibility is the centre of animal life
this excites consciousness which calls into play

volition & this determines our actions, The blood

is the centre of ^{vegetative} animal life & contains the materials

of every organ. The two spheres are sometimes

blended as in the skin & nerves, ^{for the peripheries} Our senses being

independent of volition ~~these~~ receive impressions & excite

sensibility which excite consciousness & so on: Muscles also

act independently of volition as those of the stomach

those concerned in respiration & volition comes into

play in supplying elements for the support of vege-

table life & ejecting the secretions, In the brain

& nerves, heart & vessels are in the two spheres of life

The phenomena of ~~organic~~ ^{life} matter are divided
into 3 classes, the Phen of inorganic matter, the
Phen of organic matter & the Psychological Phen.
Some have supposed that organic ^{inorganic} matter
were originally created distinct & that organic
matter is always produced from organic matter
as animals from vegetables, the two spheres of animal
& vegetable life touch at their surfaces as in
the case of spongia which are by some consid-
ered as vegetable by others as animals,

As to regard to organic matter we must consider 1st
Chem comp: 2nd organic form 3rd organic nature 4th
organic state. In animal matter there are 4
essent^l elements with several additions in veget-
able matter not less than 3 essent^l. The tendency of
organic bodies to decomposition is the effect of these several
elements not being neutralized, they all having had
originally a gaseous form have a tendency to reassume
it. Inorganic matter the elements are always neutralized.
Another striking difference between organic & inorganic
matter is this. The natural state of inorganic bodies
is a state ^{rest}, their particles are at rest until decom-
position commences

Organic bodies are necessarily in a state of motion
a state of just being destructive of ~~some~~ organic
life, & productive of decomposition.

Lecture 2^d —

(Many physiologists failed in their attempts to analyse
the different ^{organic functions} tissues because they made their experiments
on the organs of man. Man being a combination of
the simple organs as exhibited in the lower animals
we should commence by exp: in these. We should study
organic matter as regards 1st the chemical ^{nature} & properties
2. Its varying conditions 3. The different states in which
it exists 4th Primitive form 5th organic nature, as albumen
& 6th Organized form which it assumes in forming a tissue.
Vegetable ^{principles} elements consist of 3 ^{carbon hydrogen & oxygen} essent elements as before
stated, animal of never less than four, oxygen, hydrogen,
carbon & azote. we find other elements in some tissues.
as iron, silicon, fluorine, sodium, calcium, phosphorus &c.
e.g. The brain ~~contains~~ contains phosphorus. The phos-
phorus however ~~contains~~ seems under some peculiar &
modified form for if you expose the tissue to heat
a phosphorus crust is ^{formed}, which prevents farther change
& although you expose the it to greater heat than
is necessary to ignite phosph: it will not burn
The chemical decomposition is necessary in order to bring the

[illegible]

phosphorus to its natural state. We next consider the
in various forms of strength & influence. In organic matter
Varying conditions of organic matter: they are 1st Organic
compounds are binary & their elements are mutually neutralized
ble matter, such as albumen, the vitellus or yolk of
hen's oocyte then in no tendency to decomposition, this part requires
an egg, which is suited for organization. 2^d Organized
extending from the simplest triphosphate sugar are changing temporary at the
matter, in this state it constitutes tissue such as the nervous
compositional cellular products are sometimes temporary sometimes binary, animal
muscular &c. 3^d Inorganizable normal matter such as
mucous & other natural secretions. 4th Inorganizable
phosphorus in the cerebrium, this a small portion of an additional amount will pro-
abnormal matter products deposited by organs in a diseased
state such as the tubercles, deposited in the lungs &c.
characterized as the destruction of the ductility of the matter of the organ.
As this accumulation is incapable of organic functions
it has no relation to the vital system we cannot act upon it
& decomposition, hence the principal action of our remedies
is as to bring about its removal. It remains a cause of irrita-
tion & is destruction of life. *Schroeder has been lately shown by Fran-
Küller has discovered a nucleolus in the nucleus which is a part of the nucleus*

We now proceed to consider the different states in which
organic matter exists: these states are two organica viz
solid & fluid; in the latter state it is a solid
dissolved in water, which has the peculiar proper-
ty of holding solids in solution without destroy-
ing their properties, whatever may be the nature of
this solid. *The fluid is the first state of organic matter & the solid is the second*
As the acts of life are nutritive & formative
the solid & fluid states are necessary to the functions of
an organic body. The solid not only gives form to the
organic body, but it contains the fluids & distributes it to

I consider vitally as the effect of organization, but
if we examine its animal in its simplest stage we must
accede organization to vital forces. In the formation of
life & fluid we see that there must be a force inde-
pendent of the matter itself. Thus the blood is forced out of the
ventricle of the heart, circulates in channels
from the capillaries & finally enters the venae cavae
there is undoubtedly a great work for the vital
action

The action of praeputial acid is on the economy from
the existence of a vital force which may be
arranged in a ~~number~~ ^{series} of degrees of organization of the tissues
There is in the question it seems a matter of
importance to distinguish between the vital forces
the vital forces & the anatomical elements
or between functional & organic forces, but
these distinctions merely lead to a question where
they are a ~~boundary~~ ^{line} between life & death
I remain the cause of disturbance of the life &
within the harmony of the vital forces -
The first act of reaction of vitality in the formation
of conservation which precedes the formation
of the body, each again has a type after which it

the different parts of the body. The fluids contain the elements of wh. the solids are formed. The fluid is the element ^{form} of life & every solid must be formed from it. As the successive acts of life consist in composition & decomposition, every tissue must be formed of a solid & fluid the fluid being as much a part of the organ as the ~~fluid~~ solid. Excess of fluid produces congestion & inflammation & thence ^{by oppressing the organ & obstructing its vital action} disorganization. If there is a deficiency of fluid ^{contraction} induration is brought on. ^{Every structure has its form proportion of solid & fluid being the greatest the permanent of fluid the more solid in the form of life}

4th division relates to the primitive form. Each particular ^{constant} endo-species has a particular rudimentary form. ^{usually spherical} The sphere is the most simple form of antagonism. Prolegimen membrane when examined through a microscope presents ² heteroceph. the ramifications of its vessels minute globules ^{appearing} united by albuminous or plastic matter. This matter is the base of all organic structures: it also ^{constitutes} divided parts. The Vitellus of an egg presents the form of numerous ^(vesicles) spherules floating in (albuminous) fluid; ^{matter} organizable. always presents this form. Coagulable lymph for instance contains small spherules, the ten thousandth of an inch in diameter. These are also found in venous blood, ^{but not in arterial} lymph. — supposes that these spherules which are found in coagulable lymph & venous blood are

is developed & which is preserved. Artificial can
produce deviations from these types & again disease -
that is a class of destruction & a higher reaction
- a ~~form~~ recuperation reaction which tends to
restore the natural state of the function organ & the
function. Thus a great number of diseases occur
because the power of life as so
affected that nature is not sufficient to bring about
reaction & artifice aid is required -

The excess or deficiency may be either general or local

Vital principle or organic force only manifested
by the phenomena of organic matter, as all other
forces are only known by the changes which they produce.
Organization & life coexist, organization is the manifestation
of life, the an encephalic phenomenon, we can detect
the effects but of mechanical & chemical forces
& disease origin we are immediately before us.

the origin of the red globules of the blood, that they are carried into the lungs & undergo a change during aeration. Plants present the same phenomena, ^{of which,} the green fecula of the marsh asser. the vesicles when kept under disclose a fluid containing elementary spherules. The fecundating powder (pollen) of the marsh mallow present the same appearances. The primitive form which organizable matter assumes is always globular. This form is produced (mathematically demonstrated) by the antagonism of an internal force & an external resistance.

Nov. 18th 1839

Pathologists have at different times fallen into two errors of an opposite nature: the fluidists attributing all diseases to the fluids, on the supposition that the vital principle resided in them: the solidists on the contrary supposed that the disease was attributable only to the solids, whereas both are concerned. The fluids cause disease in three ways. 1st by excess 2^d deficiency 3^d vitiation of the fluid.)



The diagram represents the appearance of an embryo, composed of vesicles in an albuminous fluid. the light spot representing the point at which vital action is communicated by the mother: a movement commences among

the phenomena of life vary in different organic bodies
but there are phenomena common to all formation, creation
the essential character of the vital principle that is
created. ^{the formative} Unity of the individual is the terminating point
of all past phenomena. The life of each organ is the life
of all & the life of all is that each organ, that life of
each molecule, ^{the} tissue is the life of all.

The vital principle seems to remain latent just as color
is, certain conditions for life being present then in perfect
quiescence whilst the other conditions be added the condition for
the initiation of phenomena of life & action commences, then
the vital principle remains latent in seed ~~rests~~
for years, as the ~~seed~~ ^{egg} ~~chick~~ ^{chick} for the best of thousands
years of the life in germination, such the animals
as the ~~which~~ ^{which} may be kept dry for years & as soon
as a drop of water added the phenomena of life
commence. Eggs offer another example of latent
life passing during the winter as life is apparent but
in the spring the vital principle, ^{and the life is brought about} produces the phenomena
of growth & vegetation. Individuals have also been
known to remain some days without exhibiting any
signs of life & afterwards recover from a complete prostration
in a short time, or also at once revive slight stimuli.

the vesicles & they then assume the following form

Then a cloud is formed by this process as seen in the annexed figure. ^{clouds has disappeared, the germinal vesicle & are to be seen upon the four cells. these last increase in number, until they become sufficiently numerous to form a periphery of the animal.}

in the annexed figure it begins to rub on the form of the animal



This solution plastic matter is in solution in the serum & exists in the blood vessels of all animals, by which it is distributed to the different parts of the body it passes by exosmosis through the coats of the capillaries & thus nutrition takes place. During inflammation the plastic matter is thrown out but being in a morbid state it remains fluid - pus: & thus suppuration is effected. The pus contains globules similar to those of the blood but larger & colourless. ^{Infiltration of serous membranes} These plastic matter is diffused over ^{their surface} serous membranes by exosmosis: the water disappears & a membrane is formed by which ^{serous surfaces are united} serous surfaces are united. Schismas, tubercles &c are modifications of plastic matter & appear resemble organized texture matter.

Roaspail accounts for the formation of organic ^{matter} in the following way "An atom of water unites with an atom of carbon (thus it is composed of carbon, oxygen & hydrogen) & forms a vesicle, having the properties of endosmosis & exosmosis, & absorbing those elements which are suitable & rejecting the rest. In the formation of vegetable matter as wood, a solid base is taken in as potassa. When a

produce powerful effects, & rather the most powerful
stimulants & perfectly inert

When vital forces have shown that a common phenomenon
is exhibited by life & that is formation, but you exist
without formation, then are distinct & seem the same
from the vital principle they are entirely connected with
life & consequently ~~are~~ vital forces. There is usual
great confusion in the use of the term vital forces, which arise
in the phenomena not less separate. The force exhibited by
the nervous system should be considered either as forming
the vital forces. The German & French physiologists
maintain that a nervous system is necessary for life -
It has been objected that in the lower animals you find in the
liver gelatinous body, in which you cannot trace any thing
but nervous. Others say that this is true but this is only
an hypothesis, with saying nothing like nerves cannot
be detected in the vegetable world. I detect in the
liver just food to detect its presence but I think that
the ^{liver} ~~liver~~ ^{liver} all has attempt at demonstration been
made & has since been refuted. I have spoken both
the physiologists that a nervous system is indispensable
to life are much against it & in the German
house. Now how entirely joined is this!

volatile base is absorbed (ammonia) animal matter is produced. Thus ammonia being composed of nitrogen & hydrogen we have the animal vesicles formed of oxygen, hydrogen nitrogen & carbon. Many animals subsist on vegetable food & it is supposed that the vegetable matter vesicles are changed into animal by the absorption of nitrogen. Each vesicle consists of similar, but smaller vesicles: for instance a globule of blood may be divided into many smaller globules. The vital power causing these vesicles to shoot out in different directions may give rise to every possible form, and thus the whole formation of the whole system may be reduced to this primitive action of the vesicles. These vesicles have the power of retaining or rejecting certain elements & by this power form different tissues.

The epidermis is formed of flattened vesicles with a nucleus in them in disease this nucleus undergoes a change. Keirnan & others have shown that the first change which takes place, is ^{(local) inflammation} ~~disease~~ is in these capillary vessels which become varicose & there exudes from them a plastic matter in a morbid or unnatural state. The Germans have ^{ob}ascertained the same results with out any knowledge of Keirnan's experiments, thus confirming them.

We must now consider the 5th division viz the particular

nature of organic matter. The three principles generally acknowledged are Albumen, Gelatin & Fibrin with perhaps urea & caseine. Albumen appears to be the original ^{principle} matter from which the others are formed. It is the principal component of the vitellus of an egg & of blood. It exists in chyle & lymph. There appears to be a slight difference between the albumen of the egg & the serum of the blood or ovalbumen & seralbumen. The white of egg is albumen dissolved in water; when liquid there is always an alkali present if the alkali be neutralized or in any way separated from the albumen the latter will be coagulated. Albumen unites with acids & alkalies. It unites with acids as a base eg. with nitric acid forming nitrate of Albumen. It unites with alkalies as an acid forming albuminate of soda &c. Albumen is precipitated from its solution by acetate of lead & corrosive sublimate, hence eg. the latter being decomposed & precipitated ^{by it} eggs are a good antidote for it. It is also precipitated by tannin & ^{coagulation} the galvanic current mostly at the negative pole at positive pole it presents globules resembling the globules of blood (a singular fact). Fibrin resembles albumen in its composition & is probably formed from it. It is the ^{elementary} principle of muscular fibre & the coagulum of the blood. Lymph is in lymph

The state of an organic force
The vital functions are sensibility, organic or
vital, consisting of a function with ^{contractility}
sensitivity & synergism ~~sympathy~~ ^{sympathy}

Sensibility is a vital function by which an impulse
is conveyed to the nervous centres & then made known
& may be deranged without disturbance of the vital prin-
ciple. I know a lady apparently in perfect health, all the
functions went on perfectly except sensibility, which being
deranged she suffered excruciating pains —

Synergy is the function through which the different organs
of an apparatus or system are enabled to work in
harmony without which their office could not be performed.
Dr. H. has been considered the same as sympathy but I
draw a distinction for while synergy is necessary to health
sympathy is only manifested in disease & between organs
which in health seem to be little connected —

Not some time ago with a striking case of sympathy —
I was called to see a lady who suffered with excruciating pain in the head
could not obtain relief in any manner. Not being able to detect disease
in any other organ I proposed to make an examination of the brain.
As because there was any sign of a defect of the organ but
because all the other senses healthy. I found a slight pre-

after it has passed the mesenteric ganglia from which
it appears that albumen is converted into fibrin in
the lymphatic ganglia

Nov^r 19th 1839

If blood ^{about 8xix} be ~~beats~~ recently drawn from the vein
of a dog be beaten up until the fibrin is separa-
ted & then returned to the vein, it will produce
Typhus fever. If it be not ~~be~~ repeated for three or
four days the animal will recover. This is a singular
fact as it is known that in Typhus fever blood drawn
from the patient will not ~~coagulate~~ coagulate though kept
for a long time. This shows that the presence of fibrin in
the blood is necessary for the maintenance of health.
Does fibrin exist in solution in the blood or not? It does
as proved by the following facts. If carb^o potass^o be added
to the blood, it does ^{not} immediately coagulate; the colouring
matter settles to the bottom & after a while the fibrin
forms a crust on the surface. If frog's blood be diluted
with a solution of sugar & then filtered, the globules & colour-
ing matter remain on the filter & a clear liquid passes
through in which after a short time filaments of
fibrin appear. This shows that the fibrin is dissolved in
the serum. Fibrin unites with acids & alkalies in

The same manner as albumen. Comp: of

	C	H	N	O
Albumen	50	3	2	3
Fibrin	7	5	7	
	1	1	1	
	8	6	7	

That of Fibrin carbonic acid is given off

Fibrin decomposes peroxide of Hydrogen without undergoing any change: this is a singular fact & will hereafter be applied to the explanation of the phenomenon of secretion; this is demonstrated that the presence of an animal substance is sufficient to produce decomposition of a chemical compound. There is a thin membrane between the blood & the secretion which probably causes the chemical change which takes place. Fibrin exists in solution, in blood, chyle & lymph, in a solid form in muscular fibre. The third principle is

The third principle is Gelatin: it is procured by boiling the cellular tissue & forms jelly & glue. Some chemists have denied the existence of gelatin in the animal as a separate principle, they say that it is a product & not an educt. If this were so why should we find it only in particular tissues. With tannin it forms leather: it is likely that ^(tannin &) gelatin produces the principle & the precipitates it? Tannin is the base of all vegetable astringents & it is possible that it produces its effects by uniting with the gelatin

animals & the rabbits, we must commence our study of life with
a knowledge of the matter which it displays. The phenomena
Observation makes us acquainted with two sets of vital phenomena
one set within us not appreciable except by the feeling, by consequence
resp. another set going on within us without their cognizance ^{from feeling} as
the senseless they are independent of the will. Then we can observe
in other Organisms & our senses. The two orders are in antagonism
with each other, thereby commencing life with the antagonism of
the spheres. The pericellular membrane divides into two layers
the external furthest from the brain & the inner
skin & region of the senses, the interior the innermost men-
a region of sensation between the two as far from the surface
The first is peculiar to animals & termed animal life.
The second common to animals & vegetables, & termed vegetable life. It might be
supposed that there were two vital principles & functions
with vegetable life, but it is only one force taking
two different directions according to the matter in which it
acts. It is at the centre of these spheres that the phenomena
are most distinct, at the periphery the mixture. The animal
sphere consists of the brain, ^{as a centre} nerves & muscles
The vegetable sphere consists of the sanguine fluid, & is
not the least for its expansion & contraction tends to push
the animal sphere inwards. The animal part of the

6. When organic matter forms ~~as~~ ^{a particular form} tissue it assumes
this is what we mean by the organized form of matter. It
was supposed that every tissue was formed of rudimentary
fibres. With the microscope we can separate the
fibres into still smaller ones ~~which~~ until at last we
come to a fibre which cannot be farther divided.
It is not possible to detect nature in the first step which
she takes in the formation of an organic being. In tracing
back her operations we at last arrive at a point
beyond which we cannot go. We see first the form vesicle
united by animal glutinous matter, secondly the vessels
thirdly the fibre ^{from} which the tissues are formed. We
see this formation in vegetables, the rudimentary form is
is fluid a vessel, & when ^{the vessel is formed} ~~it is~~ ^{solid matter} a fibre.
Vesicular, fibres are formed by the superposition of these vesicles.
These vesicle cells are generally round but they assume
various shapes under pressure. They may be flattened by a
lateral force or if spherical be surrounded by stress and
pressed on all sides it will become a dodecahedron, a section
of which is hexagonal. This form is exhibited in a plate
shown by B. P. representing the cross-section of a plant
seen through a microscope. The tubes formed by these
vesicles are not continuous but divided by numerous mem-
branes, the fluids in circulating, passing through these

1. The phenomena of the exterior world, are of four orders & they
 more or less to living beings, they are 1st ~~the~~ ^{the} ~~phenomena~~ ^{phenomena}
 2^d the dynamic force, is electricity, heat, light & magnetism
 animal & vegetable examples. 3^d the phenomena of light & elec-
 tricity & there is a strong analogy between the nervous phenomena &
 galvanic, & organic physiological phenomena from which
 is deduced the principle of animals. 4th Psychological phenomena
 or those of mind which cannot be supposed to depend on a material force
 Having ascertained the ^{character of the} phenomena which are to be explained
 we proceed to the consideration of the matter which will be the
 elements make them do so that there are two kinds of
 matter organic or inorganic - Buffon supposed that
 these two are distinct from the beginning & cannot be converted
 into one another but this is not so, 1st Inorganic consists of simple
^{elements} elements or water &c but contains matter in and from
 inorganic, 2^d by a chemical principle can be converted into
 inorganic matter and its true can be found artificially
 but it is not an organic principle it is only a product
 which is thrown out from the system, 3^d Organic matter is
 destroyed by fire putrefaction & is not reproduced
 & exhausted, 4th Organic cannot be converted into inorganic by
 the force of inorganic matter but only by the force of
 decomposition, consequently the matter we see the necessity for

membranes. The polymeric membrane is at first formed of vesicles aggregated together indissimulably; they then arrange themselves so as to form channels; then a membranous lining is formed in these channels & thus producing vessels, some of the matter external to the membrane is then converted into blood

If we examine ^(of the embryo) the figure, we see Hyaline vessels which seem to melt into the plastic matter, these vessels are about ¹/₃₀₀₀₀ of an inch in diameter. ^{Heparites} These vessels seem to be composed of

a single membrane. The nerves can also be traced until they disappear in the plastic. Nerves are in the form of tubes containing a semiliquid matter, & have their origin in the plastic matter. Many worms have no sensibility in their natural state, but by a slight modification of their condition they become very sensitive: the plastic matter being the source of the nerves may itself become sensitive & thus produce this phenomenon. The medusae present an analogous form case. Although apparently nothing more than a jelly they possess sensibility: they have no stomach & yet they digest solid bodies just as fish; they have no vessels & yet they secrete a highly acid liquid. The first organized form is that of a fibre shown both in vegetables & animals: by the aggregation of these fibres a cylindrical & membranous may be formed. Hume & Bower have asserted that muscular fibre is a succession of globules, but

Japan lies a the community, by the aptitude of light vegetable
decomposers carbon acid and appropriate the carbon to them
substitution by the aid of water, the vegetable tissues are found
for inorganic matter, the higher order of animals cannot
convert inorganic to organic matter, how ties with the
lowest stages as the stages I cannot conform, but some
convert vegetable matter into animal; Organic matter is
the food of animals, the gregarious animals live on the
vegetables the carnivorous & the gregarious
Organic matter is then of two kinds in appropriate to the carbon
speculation, the other to that of animals

Wherever an increased vital action is to be sustained there must
be an increase of the fluid at the seat of such increased action, hence
the means we use to reduce the action, abstraction of blood, would be
inadequate for the disturbance of function the solid with the support the
means to alteration of the solid, but the fluid is just as necessary - the
increase of blood producing competition to order the function of the part
— Potential form of matter, The rudimentary form is a sphere
containing a centre of germination, which when brought into action
becomes a sphere, which appropriate to surrounding matter gradually
enlarges & forms itself into a higher condition. (See)
a vesicle found in the Volvox planorbis which is a sphere of cells
the central cell is a mother cell which is surrounded by a layer of
all the other cells which are daughter cells, some of which are

Classification of the Tissues--the proximate and anatomical elements of the organism.

FIRST DIVISION.

Tissues proper to the organs representing or manifesting the actions and functions of organic, vegetative, or plastic vitality.

CLASS I. {	Cellular, Plastic or Generative Tissue.	{	ORDER I.—Adipose Tissue.	{	a. Fibrous.
			ORDER II.—Sclerous, Stratified, or Hard Tissues.		b. Elastic Fibrous.
			ORDER III.—Cystiform Tissues, Two families. <i>First family, Se- rous Tissues.</i> <i>Second family, Sy- novial Tissues.</i>		c. Fibro-Cartilaginous.
					d. Cartilaginous.
					e. Osseous.
					a. Arachnoid, (cerebro-spinal.)
					b. Sensual, (of senses.)
					c. Thoracic.
					d. Abdominal.
					e. Genital.
					a. Bursal.
					b. Thecal.
			c. Capsular.		
			ORDER IV.—Angeal, ramified, or vascular.		a. Arterial.
			b. Venous.		
c. Capillary.					
d. Cardiac.					
e. Lymphatics.					
ORDER V.—Dermoid, or External Peripheric.	The skin.				
ORDER VI.—Mucous Tissues.	a. Digestive.				
b. Respiratory.					
c. Glandular.					
d. Urino-genital.					
e. Mammary.					

SECOND DIVISION.

Tissues proper to the organs representing or manifesting animal vitality.

CLASS I. {	Nervous, or Incitative Tissue.	{	ORDER I.—Cerebro-Spinal.	{	a. Sensorial, Central-ganglion- ary, Dynamo-generative.
					b. White Fibrous Medullary, Dynamo-conductive.
			ORDER II.—Ganglionic and Sympathetic.		c. Peripheric, or External Gan- glionic—nervous expan- sion of sensitive organs.
				{	a. Central Ganglionic.
				{	b. Gray Fibrous.
CLASS II. {	Contractile and Mo- tor; Muscular or Sarcous Tissue.	{	ORDER I.—Voluntary Muscular Tissue, External.	{	a. Muscular system of Trunk and extremities.
					a. Cardiac.
			ORDER II.—Involuntary Muscu- lar Tissue, Internal.		b. Membranous, Digestive, Res- piratory, Vesical.
				{	c. Uterine.

CLASS II	Sarcous Tissue. for: Muscular or Contractile and Mo-	ORDER II—Involuntary Muscular Tissue, Intrinsic.	<ul style="list-style-type: none"> c. Muscle d. Primarily Voluntary y. Muscularization, Digestive, Res- c. Contractile y. and extrinsic d. Muscular system of trunk
		ORDER I—Voluntary Muscular Tissue, Extrinsic.	
CLASS I	Tissue Nervous or Insensitive	ORDER II—Glymphatic and Contractile	<ul style="list-style-type: none"> y. Gland Epithelia c. Contractile Contractile y. and of sensitive organs c. Primarily—Nervous ex- y. Descriptive of External Con- d. Ducts—Contractile y. White Epithelia Medullary d. Ducts—Contractile c. Sensitive Contractile
		ORDER I—Cerebro-Spinal	

Tissues proper to the organs representing or manifesting animal activity.

SECOND DIVISION

CLASS I	Sensory Tissue or Cellular Plastic	ORDER VI—Muscular Tissues	<ul style="list-style-type: none"> c. Muscular y. Primarily c. Contractile y. Descriptive d. Digestive
		ORDER V—Descriptive of External	The skin
		ORDER IV—Intrinsic, primarily of	<ul style="list-style-type: none"> c. Glymphatic y. Contractile c. Contractile y. Descriptive d. Voluntary c. Contractile y. Intrinsic d. Descriptive c. Contractile y. Voluntary d. Descriptive
		ORDER III—Contractile Tissues	<ul style="list-style-type: none"> c. Contractile y. Voluntary d. Descriptive c. Contractile y. Voluntary d. Descriptive
		ORDER II—Sclerous, Contractile	<ul style="list-style-type: none"> c. Sclerous y. Contractile d. Descriptive c. Sclerous y. Contractile d. Descriptive
		ORDER I—Adipose Tissue	<ul style="list-style-type: none"> c. Adipose y. Contractile d. Descriptive

or plastic activity

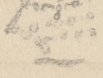
Tissues proper to the organs representing or manifesting the actions and functions of organic systems.

THIRD DIVISION

its rudimentary form appears to be a fibre (I may perhaps
atube) The smallest fibre which has been described is ^{.0036} ~~1/1000~~ of an
inch in diameter. The fibres are surrounded by ~~nerve~~ ^{capillaries}
& capillaries. When placed in juxtaposition they constitute
lamellae & of these lamellae any membrane may be formed.
The epithelium of the intestines seems to be composed of plas-
tic matter without fibres.

Nov 21st

Organic matter is not confined ^{to the production of} to any particular type
or form. Its tendency is to assume some organized form
it may be tendon, muscle, nerve or bone. If a bone is to
be repaired the plastic matter is effused & becomes bone
if a tendon or muscle be ruptured the same plastic
matter is thrown out. In the embryo there is a plastic matter
which assumes the form peculiar to the genus or species
^{of the animal} to which it belongs. The various organs when completed are
not homogeneous, being formed of cellular tissue, nervous &
muscular tissue. Feneal arranged his analogy according to the
tissues affected. Richat to whom physiology is much indebted
has multiplied the tissues too much by compounding the com-
pound with the simple. At present we consider that there
are ^{the three} ~~three~~ primitive tissues viz cellular, nervous & muscu-
lar. The cellular seems to form a bed or mould for the others

according to the circumstances in which they are placed, sometimes they take
an annular form, then from the globules form a sort of spongy
product in form, the whole first from ^a similar & then a decrease of them
forming the 

Müller has come to the conclusion from his observations that
cancer of the morbid growth arises from vesicles & ^{cytes} cells in
medullary sarcoma they have, in carcinoma the walls adhere
in medullary sarcoma, this is a great distinguisher of the two
which contain cysts with cysts from a more granular
in form when seen I cannot recall with a view to test
Müller's views took in section of medullary sarcoma & cysts
of a water & injected with the serum of a dog, which produced
this disease in the dog from of it. This accords with the fact
that the disease almost always returns after a certain time - these
cysts are .0054 of an inch in diameter - No such thing happens
in or later stages growth, all the morbid growths are analogous to
normal processes in medullary sarcoma & the spinal marrow

The internal organization corresponds with an external form
in that a naturalist for a single hour can tell the form
habit & structure of the animal -

Man ^{is a vertebrate} consists of the organized part of all the lower orders of
life & in his development passes through every form
of life & classification & animals. See recent papers

Cellular tissue is composed of gelatin, nervous of albumen
& muscular of fibrin. ~~The muscular also~~ Cellular tissue has
been termed, mucous, reticulated, ^{filamentous, areolar} fibrinous & canellated,
— cellular is generative, considering it the matrix
in which the others are formed, but we do not find it in
proliferous as the plantar matter or plasmas (Myxema) in the origin of the
the proliguous membrane. It derives its name from
its structure when dried it appears reticulated when
in animal life it appears to be formed of numerous cells
(or cellules), The fluid which distends its cells during life
disappears at death occurs, some have supposed the cells
are occupied by a liquid other, by ages. Few physiologists
agree in respect to it. Meckel & Wolfe say that it is merely
a mucus full of air bubbles. Norman thinks it to be a combi-
nation of the most minute capillaries. Picrost & Dumas say
that it is formed by the juxtaposition of fibres - Berroy (with
whom St. Jacques) says that it is richer in lymphatics, nervous
tubules & sanguine capillaries than any other tissue, that each
fibre consists of Hyaline vessels, nerves & sanguine capillaries
that these fibres constitute the membrane. He infers that the
Hyaline vessels are hollow because he sees them anastomosing
& finally terminating in the lymphatics. The cellular
tissue is the basis of all the modifications of organs & is
necessary to their formation. Bones do not form readily

the teeth as the basis - this is imperfect. In the Stapes the purpose of
a spinal marrow, vertebrate & invertebrate 2nd number
1st class of plants int. 3 class. 1st. Acrita (indistinct) the lowest form
of animals, no organs, a gelatinous mass of few vesicles united, gelatinous matter
as the sea Repts this is some appearance of cellular tissue, & this class belong
the infusorians, gelatinous beings containing very short snails other the brachiopods - sponges
difficult to say whether they are animal or vegetable - in the first stage of evolution class
animal being motion sponges attach themselves ^{sinks} & after form of vegetable.
Entozoa somewhat high in the scale - Animals in the first stage of organization
being no separate organs but each part performing the function of the whole -
Polypic form of organization obtaining themselves by the motion of the ciliae with which they are
provided, 2nd class Radiata, as starfish, Mollusca as mussels
4 Denticulata animals of separate articulation as the beech, insects and
5 Vertebrates, Mammalian birds & fishes - Articulate of the
4th class has a certain degree of organization like somewhat separated from
the others, but some can be subdivided into two, Animals have also
been classed according to the form of the nervous system, the radiata have
been termed cyclo-nervous, the mollusca cyclo-ganglionic -
the articulate have been termed diploneuric for the nervous system
double, the vertebrate have been termed splanchnic -
Thus given the system the classification has been put into
four or 5th class of plants, 1st class of plants, 2nd class of plants, 3rd class of plants, 4th class of plants, 5th class of plants.

rests upon the surface, which he thinks is rudimentary
where they are not surrounded by cellular tissue, as in the case
of the joints surrounded by the capsular ligaments &
the cranium. If the cellular tissue is the base of all new for-
mations, it must possess all the properties of vitality. Its cha-
racter is not every where the same it presents 3 classes in
which the different elements prevail. In the first class viz
fibrous tissues the lymphatic element predominates & the
nervous is at zero. In the second the capillary vessels &
the sanguine element predominates as in parenchymatous
mucus membrane & skin. In the third, the nervous
element predominates & the lymphatic is at zero as
in the nerves & spinal marrow. (The sanguine element
being slight) The cellular tissue is continuous throughout
the body forming the mould in which the various parts
are cast. It exists every where except in the nails teeth &
hair. Though continuous it may be divided into two orders
one loose called the atmospheric cellular membrane, the
other close, called parenchymatous tissue, which is necessary
for the protection & form of the organs: as a muscle for example
each fibre is surrounded with a parenchyma. The
tissue resembles a sponge, the fluids granulate in it, hence
persons having oedema, have their lower extremities swollen
when standing sometimes by puncturing the feet the

Arthropoda - divided into, Cephalopoda, as on titles -
Gastropoda - snail, higher organization than most fit class - distinct
senses, eyes, hermaphrodite - impregnate one another. Distinguished as
amphipods from their shells of carbonate of lime which is connected with organic
life; the phosphate is connected with animal life -
Arachnida - crustacea - as crabs & lobsters - have eight legs, growth
takes place by casting of the shell - they have the property of casting
their limbs if broken ^{when broken above the articulation of the joint} at or above the second joint - Arachnida
or spiders, eight legs, separated at joint as heretofore if
broken. The joints hermaphrodite & distinct life. have
they articulate at joint under such circumstances -
Insecta - characters of six legs - eyes, compound, antennae
wings - they pass through a complete metamorphosis, it is probable
that the external structure gives the external form 1st Larva
& Chrysalis 3^d Imago with fewer segments than the larva
has. When, in connection with this external change is a
change of the nervous system, we have a general change
segment. in the imago several centers in the thorax & a few
large masses also in abdominal portions. We shall apply the
description, it is probable that the fine nervous of the larva is
the principle of the imago in a yet usually separate
organization & functions. Metamorphosis I lay in three changes, larva
and imago & chrysalis, each of which has a general

whole body, maybe emptied. A woman (a patient of Dr. Jackson) who had hydrothorax, ascites & general anasarca was relieved by punctures in the feet. The quantity of cellular membrane differs according to the age, sex & temperament, hence children's limbs are more rounded than adults'. Women owe the beautiful contour of their limbs to the abundance of cellular tissue; it is most prevalent in lymphatic temperaments hence their rounded limbs & deficiency of beard. Whenever there is free motion ^(atrophic) cellular tissue abounds as in the arm-pits many organs are embedded in it, as the kidney, pancreas, & pancreas. In the brain it is not perceptible to the eye being very delicate. It is elastic, flexible transparent & in some degree contractile. In some diseases it loses its contractility as in Asiatic Cholera where the appearance of the skin is that disease: it is generally resilient in proportion to the activity of the vital functions. This property is known under the name of tone or tonicity. In its natural state it has little or no sensibility but in disease it sometimes becomes very sensitive. The spongy portion possesses a slight degree of organic sensibility for if it be exposed to the action of the air or any acrid matter it becomes painful. In suppurative inflammation plastic matter is thrown out & forms a barrier around the affected portion thus limiting

a pair of eyes - Annelida as leeches - Lumbricide
Rotifera - these little animals have a high degree of organized
digestive apparatus, muscles, the ventral stream bed
inapparently dead but on being mortified they are revived &
resume their activity, they may be revived 7 or 8 times.

Entozoa - but ~~not~~ ^{or perhaps} of articulation -

Vertebrata last order - Mammalia distinguished by their
suckling their young - This class shows how the type of the animal is modified
according to the circumstances in which they are placed, thus some of them
live on the surface of the earth, some in water, others in the air.
Types become present - but showing the cetacea - and
^{showing many} of mammals. There are about 60,000 forms that
we know of, but they are all encompassed within a few types, the system
corresponding to the interior, except in the case of monsters, who have
acquired an amount of organization beyond the ordinary
of an entire form, working on a few principles, from which
some millions of forms are produced - This is a fine function of
this plastic form, to admit the growth of a certain part, while
the form we cannot say, but whatever subject we pursue we
lead on to the question of form which we cannot complete.
But in fact there is a ^{and} regulating function, also there is
a similar law regulating pathological phenomena, which we
may also find in external causes sometimes internal, while the

the disease. It is liable to erysipellate inflammation
the disease seems to be seated in the blood there is no plastic
matter thrown but there is diffused in the cellular tissue
a liquid which is not coagulable. It is sanies; this
must be gotten rid of by incisions. I think it probably arises

Nov. 25th 1839

When furuncles are made, large quantities of dead tissue are thrown out. I believe to
a certain extent the tissue, and discharging apparatus, and the line of demarcation
Cellular tissue is subject to a variety of morbid conditions
frequently the type of acute inflammation, the cellular tissue in the condition is full
e.g. acute & chronic inflammation: it is also subject to specific
with vessels indurating and hard, in the centre the cellular tissue loses its vitality &
as well as general diseases, as in Sclerema of children, a disease
from a foreign mass. It looks as if a foreign agent had got into the point, & formed
unknown in this country but common in Europe, it is also called
death of the flesh. Cellular tissue in the night I frequently observe, hence the
sclerema band: the tissue becomes hardened by the induration of the
solid mass which can only be thrown from the system by the destruction of the surface
plastic matter. This is a white induration affecting adults, depend-
ing upon the same cause viz an induration of the plastic mat-
ter. I think it is very probable that the origin
is correct of the cause of furuncles existing in the blood, & pointing to the cellu-
lar tissue rendering the cellular tissue hard & stiff. I have
a pathological action is set up in order to eliminate it. Inflammation
several cases during the year. A lawyer from S. Carolina lately
diffuse erysipellate erysipellus. It may originate in the skin of course, & the
had his tongue & lips so affected as to injure his articulation
cellular tissue, but what I wish to call your attention to is the newness
very much. There was no change in the colour of the parts, but
of erysipellus of the cellular tissue without any affecting the skin (see above)
they were very much hardened, it frequently attacks the breast
part so hard & white as to resemble marble, no superficial whitening can
& neck; had a sore of the thigh so affected as to stiffen the
of Dr. A. B.
knee joint caused by arsenic given until anasarca was pro-
duced, which softened the tissue. It is sometimes cured by anti-
phlogistic remedies. The patient whose lips & tongue were affected
had leeches applied to the parts every 3 or 4 days for 2 months; he

The disease runs its course in a regular way. It is therefore our business to understand these laws & keep the disease in its regular course & in all the plastic diseases we have these regular phenomena which we see the same for thousands of years. In the diseases of animal life a different law exists. Cause of failure in pathology is the too narrow view which is taken of the question of causes & the effects they produce.

The laws of pathology must be based on the laws of physiology - it is true that there is a law controlling the vital force in physiological phenomena there must be a similar law regulating pathological phenomena.

We have seen that every vessel is formed from a fluid - & a continuance of life is a mere repetition of the act of formation - I shall therefore the blood is the plastic & fungible fluid circulated, though the

cellular tissue subject to chronic inflammation following acute disease attended with formation of matter without pain or tumefaction. It

is a case of this kind - which large quantities of matter were discharged through a puncture made when the skin felt a little uncomfortable

Scleroma common at hospitals of France & England I have known but one case of this country. It consists in the deposit of the cellular tissue of a gelatinous substance containing shagreen & blue color by matter of blood - very fatal -

A woman entered the hospital with white induration of the breast which had been of several years' growth. She died apparently of impeded respiration, the only fatal case I ever

was nearly relieved when he left the city.

{The cellular tissue in this case contains an albuminous matter.

^{Sometimes} Muscular follows chronic & sometimes acute diseases. it is to be referred to the blood's containing less plastic matter. The blood becomes affected by chronic diseases, fibrin disappears serum predominates & a general effusion takes place. it is sometimes caused by congestion, often arising from pressure of a carcinoma of diseased uterus pressing the vena cava & causing oedema of lower extremities. Cellular tissue is subject to Hypertrophy & atrophy. Hypertrophy is generally connected with other diseases. Atrophy (especially of the adipose tissue) sometimes occurs as an original disease but generally ^{is the} consequence of chronic diseases. It produces great emaciation. In the case of Calvin Edson the living skeleton the ^{adipose} (cellular) tissue was probably entirely wanting. the mucus was in its natural state. Although his muscles were shrunken his strength remained. The adipose matter had disappeared from the bottom of his feet requiring his shoes to be stuffed, in order to enable him to walk; his chest & cranium was in a healthy state.

Elephantiasis is caused by plastic matter filling the cells of the tissue & enlarging them. There are two varieties of this disease the Elephantiasis of the Greeks ^{or Bartholin's bag disease of skin} & the Elephantiasis of the Arabs. In the former the enlargement is tubercular as in the drawing exhibited (face affected). It is very rare in this country, saw

It is common about the neck, I have seen it attack the integuments
of trachea which impedes respiration very much. It consists
in the deposit of an albuminous matter. I consider it a disease
of the lymphatics - Elephantiæ of the Greeks disease of
skin, & of limbs disease of cellular tissue

Anasore is sometimes an acute disease arising from poison
but - Sometimes occurs spontaneously

It is now doubtful whether there are not distinct growths

Muller considers adipose as cellular tissue containing a deposit
of fat. Rapsil Blumville & others it a distinct independent
of cellular tissue, If adipose tissue be laid on a skin exposed
to heat & a stream of water the cellular tissue will remain behind &
consist of granules of oil through which consist of cells containing


a case from S. America. where it is not very uncommon. In the latter the surface is even & regular in its colour. When it occurs in the abdomen it depends very much, drawing down in which the abdomen hangs down to the knees. The negroes in this country are very subject to it—




Emphysema takes place sometimes after exposure to the cold. When the arm has been exposed to cold there is sometimes instead of rheumatism, an effusion of air into the cellular membrane: the arm swells & the crepitation is such as to resemble that of a fracture. Dr I saw a case of spontaneous emphysema surrounding the whole body—

Cellulography subject to transformation

Probably all cases of transformation of tissue are to be referred to the cellular tissue. There are two kinds of transformation one in which the part formed is a natural organic substance but misplaced as in cases of ossification. In the other it is heterophyte ^{or heterologous} as in tubercular affections, the latter is not properly a transformation, being merely a deposit of inorganized matter. The cause of this affection is not known; All that we know is that the cellular tissue is capable of these changes.

Adipose tissue is a modification of the cellular. Vieillot first established the adipose as a distinct modification.

The cells in the cellular tissue are angular as shown by their hexagonal form when dried.  shown of the adipose tissue

fat. On minute examination it is found to consist of cells within
all of which containing a granule of fat.  Granule of hu-
man fat with the blood vessel supplies is  It is different in
different animals & in the same animal at different periods
of life. In some animals it opens a crystalline form & probably
during coagulation - Human fat when dried presents somewhat of
the same appearance. The fat of the dog is of a different form &
amplified. That the fat of most animals is so that that of man
consists of cells  containing numerous granules
 $\times 6^{\text{th}}$ in the cavity of joints - It is more abundant in women
than in men - Blumenbach thinks it an accident to the
venous system, the dissection of a calf he had laid bare
the venous cord & thus left it on returning & on inspection
found it covered with a layer of fat. During life it is semi-
fluid, Dr. Hunter & myself opened the body of a man who
had died some days - his fat was perfectly fluid thus
- the 11th of December

are round & completely closed & drawing exhibited: this is proved by exposing it to the sun, if the cells were open the fat when melted would run out; as no effusion takes place the cells must be closed

The adipose tissue does not exist throughout the body as the cellular does 1st. There is a layer under the skin 2^o. It accumulates around the vessels 3^o around the heart 4th between the serous coverings of organs & their processes ^{of the arteries} as around the omentum & kidneys. Whatever may be the degree of emaciation there is some adipose matter found in certain parts as around the eye, on the cheek & kidneys. ^{5th} Adipose matter occurs around the cavities of joints & certain organs, it is ^{formed} composed of two parts the adipose or cellular tissue & the fat. The fat is composed of two principles stearine & elaine, the former solid, the latter fluid. In the adipose tissue around the eye the latter is more abundant, around the kidneys the former. Fat has been supposed by some to be a secretion from the vessels of the adipose tissue by ^{arteries of the vessel} others a deposit from the blood: it has not been found in sufficient quantity in the blood to justify the latter opinion. It gives softness & flexibility to joints & other parts & affords protection to other organs. It is enamed by some as a stock of nutritive matter laid up in the system. Persons who drink much rum &c. a tendency to grow fat. In drunkards there is a tendency to an accumulation of carbon & hydrogen in the blood as shown by their breath resembling in smell carbonated hydrogen. (There ~~has~~ been

Koeggy thinks it subject to diffuse inflammation similar
to that described as affecting the cellular tissue —

perhaps merely a modification of Pleurisy

cases of spontaneous combustion) Fat being composed principally of carbon
& hydrogen is supposed to relieve the blood of this accumulation of
gas. age modifies the adipose tissue. fat does not appear until
after birth & is at first of lighter colour than afterwards. it accumulates
in early youth diminishes at puberty & accumulates ~~in~~ after age.
It is deficient in nervous & abundant in sanguine & lymphatic
temperaments, deficient in some races as in the Malays abundant
in Caucasian race. In some African tribes ^{it is} disposed to accumulate
in particular parts: about the hips & buttocks. (Woman exhibited in
France with a fundament sufficiently large to hold a water
style African Venus. It is subject to inflammation also to
Hypertrophy. ^{atrophy} In some cases it increases immensely of size!
Lambert weighed about seven hundred pounds. It is subject
to atrophy. Atrophy of cellular membrane is always followed
by it. There are ^{specific diseases} other modifications as adipose-sarcoma, in
which fibres run through it & a matter resembling fat ~~is~~
is deposited in large granules. Steatoma - accumulation
of fat in a single cell. Lipoma - ^{fat} in different cells.
Sclerous or hard tissues modifications of cellular tissue, as fibrous
elastic-fibrous cartilaginous fibrocartilaginous, osseous
then consist of the same elements as the cellular has been denoted
as containing. The Fibrous is an aggregation of fibres as in
a tendon or membrane: each fibre can be reduced to Hyaline

vessels, sanguine capillaries (very minute quantity) & nerve tubules
The fibrous tissue ^{protrudes into the blood} exists under the skin (fascia) & joins
different parts together: it also enters into the composition of bone
Fibrous tissue is a simple modification of the cellular where
they are connected, they pass into each other so as not to be dis-
tinguished. The fibrous tissue according to Bichat forms a system
of which the pericardium is the centre. There is a continuity of
fibrous tissue throughout the body; the pericardium which
was supposed to be insulated being connected with the fascia
of the neck, This will explain how inflammation of fibrous tissue
extends from one part of the body to another. Thus the pericardium
is affected in ^{pneumonia} pleuritis. Fibrous tissue does not exhibit absolute
contractility; in its natural state it has ^{ordinary} not sensibility; a
tendon may be cut or extended longitudinally ^{it gives pain} without sensation.
If however it be twisted or extended transversely an uneasy
feeling is produced. This is to be accounted for by the small quantity
of ^{tubules} nerves which are found in it. When inflamed it becomes highly
sensible. It is liable to several modifications; the most common is
inflammation, which however does not produce suppuration or ulcera-
tion. It is the seat of ^{hyperplasia, growth & degeneration} rheumatism (acute & chronic); the muscular
fibre not being affected as has been supposed to be the case, the ap-
pearances of the uniting the muscular fibres & fasciculi being the
diseased part. When the rheumatism is very acute the part instead

opart he can affect, lubricated with synovia same
nature, 4th from uniting membranes which protect the
organs which they contain & prevent injury & swelling - Thus
the spleen which is soft in the joints, also the kidneys
belong, mammary Thyroid glands, testes, &c -
The fibres uniting of part & tissue & ligaments are
a kind of dense tissue some termed cellular fibres -
5th ligament attach to the joints & are termed the
joint proper capsular ligament 6th Tendons, uniting
of bones & muscular fibres, they are composed of fibres very
dense & firmly united, manner of connection between
& tendons not exactly known, in form & sufficient
refers to them -

This ligament is subject to natural & artificial changes, & of them is
relaxation & contraction, which is much so a defect
with its functions, I saw one with 5 Physical of little girl
long to the left - excellent health, but her knees were
led from the ground for a long time but could not walk & could not
stand on account of the knees bending, & Physical pronounced it a
relaxation of crucial ligaments, I have seen two recent
letters on the same or even of the knee, I have seen
who could not stand the knees & the back of the knee - Probably
the change of the ligaments generally & the proper treatment

ively assists the will & there is a sort of paralysis, a very violent effort of the will being necessary to produce motion. The digestive functions are sometimes affected by inflammation of the tissue about the joints as in gout. Sometimes gouty & rheumatic affections produce modification of the tissue, especially the gouty which make calcareous deposits. In rheumatism there is a thickening & sometimes softening followed by atrophy of the ligaments. A gentleman in this city who he had nearly every joint dislocated, the effect of a rheumatism. The Peristone is frequently affected with inflammation. The pain is violent & ^{perforations} does not often abate. ^{common causes of small perforations of the spine are on rupture} nodes are formed. These nodes are not always dependent upon syphilitic affections, they are sometimes relieved by as a cure of a very long I saw of up repetition of this kind of leeching: they must or no care be given as cases will follow such treatment; local applications & depletion remedies only must be used. ^{When specific not directly infectious but under the} ^{permanent thickening being by long use of the corticines transform} The Elastic fibrous is a modification of the fibrous densely differing in arrangement of its fibres, only lately recognized as a distinct tissue. It obtains its name from its being elastic. It is not so abundant in man as in the lower animals. Being well developed in the ox the ligament of elastic fibrous tissue holding up the head, also developed in the horse elephant. The head is drawn down by muscles but as soon as the muscular effort is discontinued the head rises. It exists in man along the

know that give so much glibly & peculiar individual
General Rorel, & was denied by some physiologists that the
films before are capable of suppuration. But because of the
reports which form a different opinion - suppuration & in-
flammation & suppuration of dura mater - Subject to description
Subject to the effect of the film, the film consists of glands & dura
mater sometimes form much thickened, sometimes atrophy takes
place, just becomes gelatinous & the matter away - I saw one case
which ^{was} explained as suppuration of atrophy of films before
This joint was easily dislocated by muscular action - Subject to
transformation, into cartilage & bone - in ankylosis the atrophy
a skeleton preserved in Dublin when all the ligaments were effused
alignments occurs - fungus growths, Osteo sarcoma also, some-
times commences in the films before - periosteum - A gentleman
in the city had his thumb affected & a surgeon was sent to the
off, he applied to me I looked it & kept up compression
by sticking plaster the disease was kept at bay & after two
years appeared a little better, the intention & cure was
proposed, but I lost sight of him & do not know what he became
of him.

Elusive films possess very little vitality, in certain affections the joint
may, disease, inflammation - begins in the same lining, it sometimes becomes
described, announce the consequences, Subject to transformation possible

Thin yellow & is termed yellow upon in some inferior animals and
white in the coats of the arteries. The blood is driven by the action
of the heart into the arteries with great force; as soon as the
effect of the impulse is over, the artery contracts & the blood,
being prevented by valves from returning into the heart is
forced to wind the extremities, whereas the elastic coats ensure
the action is continued even into the capillaries. This is a case of a
vital physical operation being substituted for a vital. If the
arteries were surrounded by a muscular coat for producing this
motion, they would be subject to all affections to which muscles
are liable: spasm might take place & stop the circulation
of the blood. This elasticity of the arteries has been but lately re-
cognised. This tissue sometimes loses its elasticity. This occurs
in aneurism, an enlargement of the vessel being produced—

Nov. 26th 1839

Fibro-cartilaginous exists in different portions & serves diff. purposes.
In one portion of it, the fibrous structure prevails, as at the symphysis
pubis & over the bodies of the vertebrae (as the epiglottis &c).
It is subject to inflammation, which however does not originate in
the tissue, by which it is sometimes destroyed. Sometimes it is ossified.
Cartilage ^{crispulus} consists of ~~nodules~~ intermixed with minute
fibres; it does not possess much vitality & is next in hardness
to bone. It covers the articulating surfaces of bones, presenting
a smooth surface. It abounds mostly in lymphatics & possesses

leaves, sometimes artery connected into a long system, circulation still goes on but is medicinal, modified -

Fibro cartilaginous dull yellowish white of greater strength than bone & possesses considerable elasticity probably resembles it in many organs, anointment does not agree with the joints usually, & small cartilages of nose & ear, rings of trachea, cartilages of ribs & of ^{intervertebral cartilage} vertebral bodies, the subject & duration of growth & function, ulceration & suppuration & scirrhous it is not capable of regeneration, if removed small cartilages of joint be destroyed not new ligaments formed, sometimes united by bone, the first function in the union of bones is fibro-cartilaginous -

Cartilaginous tissue of purely white anastomosing cellular texture happens in three positions in the economy 1st as a temporary structure 2^d as a permanent function 3^d as a transformation in mature growth, the temporary condition is in the joints & in the ends of bones, permanent covering articulating surface of bones, here of great importance smooth & does not wear, Accidents under various circumstances, two forms principally, rounded & scutiform masses or free floating in the joint, or plates in the fibro serous membranes, sometimes in former situation in considerable number, as many as 35 in knee joint, vary in size from a millet seed to almond, source not known, See B B B

little or no susceptibility (It sometimes forms an envelope) It also forms part of the skeleton as the cartilages of the ribs. Inflammation sometimes occurs but is not original. Neither suppuration nor ulceration takes place. It sometimes becomes softened into a gelatinous mass. It is frequently ossified. Atrophy manifested in ankylosis

Osseous Structure. This tissue is the skeleton of & gives form to the human body. we shall examine its mode of formation & existence, situation & uses. Osseous matter seems to be produced in three ways 1st In the lowest grade of animals as the madrepores it appears to be merely a petrification of animal matter. The ossification of some of the tissues in the higher animals resembles this, as the ossification of the pleura, in these cases vitally seems to have retrograded. 2^d Fluids and secretions & form lamella of calcareous matter, after it is once formed it ceases to grow & does not produce further growth. Formation of cartilage in higher animals resembles this, it is a process of degeneration & does not produce further growth. In some the mollusca are examples of this formation. In some the shell remains as in the oyster. The bivalve throws off their shell & another is formed. The hardening of the enamel of teeth resembles this. 3^d Osseous tissue (proper) In it there is a combination of vessels & nerves, it is a living structure, continually undergoing composition & decomposition. It increases & diminishes. Present all the phenomena of a living tissue. The composition of the earthy matter varies. In the lower orders of animals it is a carbonate of lime, in the true osseous tissue it is a phosphate. This is peculiar

supposes that they result from acute inflammation, not cancer, sometimes found
in the mucous membrane, whether as the result of inflammation - measles
found on the outer side of joints, he presumed as plaques, in places
everywhere of kidney, ventricles of brain, tunica vaginalis testis,
Cartilage not soluble in cold water. It is in hot distilled water
cartilage of ribs gives a different sort of gelatin called chondrin.
Berkeley supposes it to consist of solid albuminous matter & a large
mass of cellular tissue. he says that it contains numerous corpuscles
different in the arrangement of corpuscles in this cartilage
which are susceptible of long transformation & then which
are not, in former discharges through the tissue, in latter in thick
of cellular tissue, Fibres of cartilage cleave a plane perpendicular
also to surface of laminae they cover, in boiling & then shake
they give slightly & then diminish the cohesiveness which would
otherwise quite separate. Cartilage possesses the lowest degree of vascularity
Some deny that they possess circulation or are susceptible of disease - Dr B
Brown says that it is vascular it has a sort of circulation for if you
cut it the dry surface will soon be moistened by the exudation of
a pellucid fluid, It has no sensibility, it is subject to adhesion
& it may be presumed that there has been inflammation, Priming
adhesion takes place on free surface of cartilage, Residue, when
dried commences in decay & is attended by suppuration - Not susceptible
of reproduction, if cut & removed in the state, Changes will

to nerve animals: & as phosphorus enters into the composition of nerves
organic life - When a bone articulates, covers as leaves the ends of bones
The phosphoric acid is probably formed by the nerve. Osseous tissue is
a combination of earthy & animal matter. It is probably merely a
mixture & not a chemical combination as they can be separated

without broken altering the form of the bone. The animal matter
is elastic fibrous tissue, its fibres consisting of lymphatics, sanguine
capillaries & nerve tubules. intermixed with these is the plastic & earthy
matter. The fibres are united in fasciculi with the plastic matter disposed
among them. These fibres are 2000 of an inch in diameter. In this tissue
the lymphatics are most abundant, capillaries next & nerves least.

In the compact structure the fibres are parallel & very dense: in this
structure the nerves terminate & the lymphatics take their origin
The cellular or articulated structure contains more, lymphatics, nerves
& capillaries than the compact, its cells are filled with medullary
matter containing more oil than common fat. Osseous tissue
is not ~~merely~~ an approach to ^{inorganic} ~~organic~~ life as some have thought
it contains all the elements of the highest & elements order of life
These elements are ^{highly} developed in inflammation. Sensibility
is always connected with active circulation, when this is increased
as in the bone to a sufficient degree it possesses vitality as elevated as
any part of the body. The bone serves a mechanical
purpose & on this account should not possess sensibility
but it is liable to be broken & should be capable of restoration, which

age in fetal life, mineral, found in early life & lost in adult
Cartilage forms the skeleton of some of the lower animals - some fishes
in reptiles. It has for its origin approaches to the cartilage -

The fibres of articulated tissue of the cranium & microscope
in section of small tubules parallel with fibres ^{some} of
which diameter with life, salivary with globules, some
of them ramify & terminate in the corpuscles of the bone, a
group action examined microscopically exhibited the opening of the
tubules. The fibres are arranged in fascicles. Fibres either parallel
or divergent latter from reticulated tissue. Capillaries not equally
numerous in all parts - In the compact tissue the fibres generally
seen parallel & are much condensed, the fibres congregated in layers
for lamellae, when they radiate from a point for radiating
tissue, when they deep from cellular.

Bone does not consist exclusively of organic tissue, but of
periosteum, diploë, medullary & spongy tissue which is the
principal part. Various opinions as to the structure of bone
before the time of Scarpa supposed to be lamellae, he reported the
bone cellular, cells compressed in compact structure, this doctrine
is generally retained by the English anatomists - Berkenhout, Bown
& other German physiologists & Guersin in France too fatal, about
the examination of bone, but not a microscope - Guersin
opposed that the fibres appeared in dilution, that it is not

requires this organization. Pathological condition. There is hardly a disease belonging to the solids, to which bone is not liable. Derivations from normal standard numerous, sometimes congenital, common. It sometimes occurs out of place as a transformation, in the windpipe being almost at the time of conception at least before the ovum has left the ovary, epiglottis lungs &c. - It differs in stage. In the foetus it is first the nucleus of abortion on. in the new animals - are myelomas - Then is a gelatinous, then cartilaginous, then osseous. It is sometimes arrested in its formation & in this case the solids may not be able to stand until the age of 4 or 5 years. If a child in this state be made to stand it will be deformed. Sometimes there is a congenital absence of osseous tissue in the head & spine (as spina bifida). ^{In my eye cartilaginous in cranial with undelimited} Regeneration of bone has been ascribed to inflammation, but this is not always necessary: In simple fractures the bone is united without inflammation: in compound fractures inflammation seems necessary, the bones having been exposed to the air. Hunter supposed that union was effected by an effusion of blood which became organized: this theory has been rejected & Dupuytren's received. The latter ^{has} supposed that the surrounding cellular tissue throws out the plastic matter which is held in solution in the blood & which is capable of forming any tissue. This surrounds the fractured part & becomes solid: then spiculae of bone shoot into it. The provisional callus which surrounds & gives support to the bone is thus formed. After a period of 12 months the ends of the bone become fused & the callus disappears. Bones broken in a joint do not unite by

from furrows or canals, it consists of canals containing infus-
sible elements of access, then in an ionic matter surrounding the
walls of these canals, then the compact structure, & the tubular
type interstices. The ^{inner} lamellae are minute, according to the con-
struction of the first lamellae in outer portion of bone. The canals surround
by lamellae 3^d of corpuscles contained in the lamellae is existing
between them. These corpuscles are ~~or~~ ^{are} ~~also~~ ^{also} ~~small~~ ^{small} black by
transmitted light, white by reflection. Ductile fibers of organic
canals perforating the lamellae & conducting blood vessels. The hori-
zontal canals enlarge & form cellular structure. This constitutes
the open system of which bone is formed. Bones united form skeleton
there in its structure there is the solid part which supports the
soft part, blood vessels, nervous skeleton is a texture
of plant tissue skeleton & nervous skeleton according to the
the structure —

Compoundly, depending upon open - hinged a gen-
erally flat osseous structure is wanting, T. R. Huxley of Peter-
bor' has a case of deficient joints

Some surgeons think that the union of bone depends upon the posi-
tion of the bone in the joint, or by the bone itself joints or, the union of
bone that it takes place by the fusion of the bone by means of the blood
effused. Bichat supposes that it takes place by granulation
for the calcification of the joint bone. The process is generally

osseous matter, but cartilaginous, it is the same case with the bones of the cranium. Within the cellular capsular ligament there is no cellular tissue consequently no plastic matter effused & no callus formed if there were such a formation it would produce stiffness of the joint. We have seen above that it requires 12 months for the fusion of bones therefore it would be necessary to keep the patient still with the fractured parts in apposition for this period in order that an osseous union might take place, motion of the parts being sufficient to prevent such union. The cranium has no cellular tissue around it and consequently there is no callus thrown out. The osseous tissue is subject to general & specific diseases, also structural modifications.

Rachitis may be considered as dependent upon a deficiency of earthy matter or a deficiency of cartilage, when the earthy matter is in the usual proportion matter is deposited from mollities. The bone remains soft for a number of years, the ribs are enlarged & the spine until the bone becomes, & produces deformity. It is very rare in this country but common in Europe probably dependent on mode of living. The softness of the bone is due to a deficiency of animal matter & excess of earthy. Bone requires its strength from a just combination of the two. When either is deficient it will be impaired. Cases are on record where fracture has occurred from a merely muscular contraction in some cases the fracture cannot be reduced.

In Mollities there is a vitiated nutrition the earthy matter not being deposited. It sometimes occurs in this country & in fact

presented by Haller & modified by Dufour as the most
reasonable according to Haller who then his conclusions pre-
sented, plastic matter is thrown out not by cutting
the bone, perosteum, surrounding soft parts or cellular
upper alone, but by them all conjointly & the plastic ^{matter then thrown out} ~~matter~~ ^{then} ~~then~~ ^{then}
takes its form for the part to be repaired, This plastic matter
is converted into a sort of cartilage as Haller supposed, but in
ligamentous matter which becomes ossified, This is the pro-
visional cells which supports the bone, if the latter be
split open it will be found that the ends of the bone are still
disunited, the cells ossifies in ^{about} 40 days, the bone is not
united for several months, This cells disappears when the
matter thrown out by the bone is perfectly formed, In certain
parts the cells is not thrown out as in the osseous when
there is but little cellular tissue in the soft parts, and in
cells will produce very disastrous effects, ligamentous
matter alone takes place through which the pulsation of the bone can
be felt. At the neck of the femur union very rarely takes place
the bone is contained in a capsular ligament which prevents the
affected callus (if there is any) reaching the fractured bone
& the bones of the unite at all much united & then an abscess
But the union is not impossible, the union sometimes occurs, as in
a son of the osseous, the ligamentous matter being ossified

cases where the hygienic condition of the patient ^{does} not seem to warrant it ^{It differs from Rickets in the bones becoming 'inflamed' after long use have been laid}

Hypertrophy sometimes takes place. There are cases on record of the cranium ^{becoming painful (exostosis)} & sometimes occurs in the femoral & humeral bones ^{an unusual thickening of the body; namely, an excess of nutritive action}. Atrophy occurs, in some cases, the bones of the cranium not being thicker than two or three sheets of paper. It takes place in various bones ^{depends upon a want of nutrition}.

Inflammation is the most common affection of bones it may arise from injuries, or ^{from local inflammation in the parts immediately adjacent} external causes; Common or suppurative; which is ^{now present at the exterior} inflammation most frequently attacks the periosteum; it may be confined to this or extend to the bone. The bone & periosteum being distinct as to their vascular supply one may be diseased & the other healthy; One part is sometimes affected by the continuity of an inflamed part. Sometimes there is suppuration ^{depends from inflammation, there is discharge of pur or serous fluid, & even}. Causes of bone exostosis & ulceration, Necrosis & mortification of soft parts. As necrosis there is death of the part ^{without inflammation by pressure as in aneurism or rupture of blood vessel} but it is accompanied by restoration; a cylinder is formed around the dead part & it requires a long time for the latter to be removed which renders an operation necessary ^{the formation of bone does not take place from independent of the bone tissue, can a trace of former bone be seen}. This an also specific affections such as Syphilis which attacks bone as well as the soft parts. Deposition of tubercles ^{in the cancelli} along the shaft of bone, Constitutional affections

Rachitis usually, terminates spontaneously & favorably, but macerates
the soft parts, great deformity results, cranium is modified,
skull & sternum deformed, but the most serious deformity is that
of the pelvis, which hinders the action of muscles of the body, hinders
or modifies in its shape or is altered with great danger in
parturition -

Frigitas, usual in old age but sometimes occurs in middle
age said to be dependent upon deficiency of animal matter
but some cases chemically examined did not give this result

Mollities is always constitutional, probably specific, it is
not a mere deficiency of earthy matter, but the animal part is
abnormal. It contains great quantity of fluid, matter as
little earthy matter that it can be divided with a scalpel from
one side to the other, can a fracture of a bone which is 3 inches
high by the crushing by the of the bone, just under the fluid part
ends & just under the bone. The only case I have seen here of
this condition is a young lady in this city

Hyphitis disease commences before the parturition - bone
forming develops & effusion of fluid, is phlogistic of bone

The specific disease develops upon rupture. It is
in the development of the cavity of the bone with dense
matter the tumor. It often acquires enormous size
filled with various fluids.

Syphilis also attacks the bones. It commences with the periosteum generally & nodes are formed, sometimes followed by necrosis & other diseases dependent upon chronic inflammation.

Spina Ventrosa - small cavities formed in the bones (occasionally exhibited showing this affection) There is a cancerous affection of bones sometimes termed Spina Ventrosa (drawing of femur shown, so affected cavity very large)

Osteosarcoma not very rare consists in a heteroplastic formation such as takes place in the soft parts - generally uncontrollable -

On the 23^d a case was exhibited in the Almshouse of Osteosarcoma. The tumour embraced the right side of the frontal & also anterior half of the parietal bone, producing ~~blindness~~ amaurosis & also causing the right eye to protrude considerably from its socket. Dr. Gibbon says that the tumour usually consists of cartilaginous matter mixed with spicules of bone. The doctor speaking on the ground that the operation would do no good & would probably cause death, by exposing the dura mater, which would induce inflammation of this membrane & subsequently of the brain. The disease originated in this case (it is supposed) from the kick of a horse on the foot a year or two back ago.

Diagnosis: certain insects (insects) of a number of
be scaly, Ortus saxonia, cartilaginous in
character within almost of the same, as the one of
cutly, with like a stage in the structure
ellidullany saxonia approaches this, name and
for number (one), but cannot say as to form
I saw a case of the the cartilage of the tube which
unfettered, but appeared in large amount
when

The following general principles may be deduced. 1st
we find that the abnormal pathological condition
of the bone consists in the retardation of its growth
nearly the ^{condition} of one part of the cartilage
physiological, of the other pathological. I saw
of a case in which scaly cartilage & the scaly part
the young man got his arm caught in the door & was bent
at right angles without fracture. It is usually
only the tube of the abnormal condition

2nd. There is a retardation of the physiological state of the
bone, as in mollities ossium & osteomalacia. & the
there is an analogy to the same order, namely, the bone

Nov^r 28th 1839

The osseous tissue exhibits pathological conditions in a strong light. It is subject to all the modifications which the soft parts undergo & they are more distinct in this than in the soft tissues. Some of these modifications seem to be merely a retreat along the line of formation: a retracing of ~~the~~ its steps: there is one disease for instance in which the bone becomes fluid.

In rickets the bone remains cartilaginous, being arrested in its formation. In mollities it returns from its perfect state to second or cartilaginous state.

In oste-sarcoma, the bone becomes fleshy. The nutrition is vitiated & a matter is formed not analogous to bone. This may follow inflammation but is not necessarily caused by it. Inflammation may produce modification & destruction both of function & structure but it does not produce a perverted nutrition or change in the character of the formation. There is in this disease a perversion of the organization.

The diseases of the bones seldom involve the sympathies. Sympathy arises from a combination of the nervous centres or ganglia (e.g. a disease of the liver produces vomiting). Owing to the absence of the nervous ganglia the bones do not involve the sympathies.

The modifications of the optic tissue may be divided into four classes, 1st Violently inflammation may occur without producing a permanent change resembles the catarrhs of the cornea, & the sclerotic, & the iris, but the first stage of development, & the second, 3^d. There is an accumulation of sanguiferous elements in the vessels, & a remarkable leucorrhoea in the 4th Divides optic the myelization, & the optic nerve is a modification of the plantiform, & the optic is altered, which is an evidence of the effect of the nutritive force 5th There is an increase or diminution of plastic activity within the optic, producing hypertrophy or atrophy. In the optic, & the optic, comes, & the optic is altered, which is an evidence of the effect of the nutritive force 6th Diseases of optic are produced by the same causes as the diseases of the optic, & the optic is altered, which is an evidence of the effect of the nutritive force 7th The diseases of the optic are only the optic, & the optic is altered, which is an evidence of the effect of the nutritive force

The aqueous & hyaloid humours of the eye are surrounded by a delicate serous membrane which secretes them. In the eye is a serous membrane secreting a delicate limpid fluid, which protects the fine nervous floating in it & transmits the impressions of sound.

2^d. Nutrition may be so modified by inflammation as to produce increase or diminution or other changes of structure

3^d. We have a modification of nutrition without inflammation as Hypertrophy or Atrophy

4th. Without inflammation a vitiated nutrition may so transform the bone that it will not possess any ^{trace} of its composition

Cystiform tissue

Serous ^{membrane} Tissue belongs to the families of cellular tissue being merely a modification of the cellular. Whenever there exists a cavity closed to the air, then is a serous tissue whenever there is a movement of one part on another there also is a serous tissue. It always forms a closed sack

It is nearly transparent, ^{thin} of great strength & its surface is very smooth; it secretes a fluid by which it is lubricated. This fluid is prevented from becoming accumulating by being absorbed. Its vitality is of the lowest order for it may be cut or lacerated without giving pain. But in the course of an hour after the injury inflammation takes place rendering it very painful.

Uses 1st It furnishes ~~humours~~ fluids which are necessary to the function of a part, as the humours of the eye.

2^d It enables parts to move or glide upon each other without friction. The heart is included in a serous membrane & moves freely

It is called Cystoma because it is always a closed sack
The serum within is so organized that though a healthy
condition it manifests but little vitality, yet is in a
state of development. It is formed by various causes
Granules of the stratum corneum cellular layer
by granules & vesicles. C. Mucosa of the capillary
3 Epithelium a more polished surface

but if this membrane be destroyed by disease the heart becomes embarrassed & causes death. The diaphragm which has much motion is covered with a serous membrane. The pleurae which enclose the lungs are serous membranes. On account of the small amount of friction of the serous surfaces. The operations of life go on without our knowledge except in cases of inflammation of a serous membrane when every movement produces a sensation of pain.

3^d. It gives protection to the parts which it surrounds, the lungs being soft & loose in their texture require this support. The great cavity of the abdomen is lined with a serous membrane which is reflected over, & gives support to, the viscera. Without this covering in which there is so little friction the functions of the organs could not go on.

4th. It constitutes channels or tubes, which conduct the fluids necessary to the support of the system. *Angiolar system*

Cystous or Serous tissue is composed of the same organic elements as the cellular, containing, hyaline vessels sanguine capillaries & nerve tubules & along with these more or less of plastic matter. Authors have disputed about its nature. Bichat regarded it as a mere epithelium. This is the case with the lowest order of serous tissue but its higher orders are found to possess all the properties of the

L. 5 Arachnoid for minutes see title
^{room down for difference of structure}
Arachnoid Membrane is one of the most delicate of serous
membranes, it is a closed sac between two coats per
metrium & it is easily ruptured, particularly the inner
coat of the brain, the brain has a membrane covering, with
thoroughly insulating, it is easily ruptured & many vessels of
(these vessels exist in the cellular tissue in various parts of
the body) the brain, it is further suspended & covered from
below it requires a membrane for its protection, this ^{of the brain} membrane
is so important that when it is pressed by any matter it
gives pain & interruption of its functions is the consequence
The fluid secreted by the arachnoid differs from the serum fluid
it does not coagulate with heat which shows that it contains
little albumen

highest order of tissues. Its office is chiefly mechanical yet
as there is often a necessity for reparation, it must progress ^{in case of} ~~the~~
disease from the lowest to the highest order of vitality

The serous tissue is not every where the same & but exist
under several different forms. There are

1st Simple serous vesicles ^{serous vesicles filled with a simple fluid} D. Arterial, vascular, tubular
or cylindrical, such as exists in the vascular system

3^d Synovial as exists in joints & those belonging to articu-
lation 4th Membranes belonging to the brain ear & eye

5th Membranes surrounding the large viscera - peritoneum
Pleura pericardium, vaginalis testis - Glanacea -

The first is not an important variety. Berries says that
a dipne tissue consists of serous vesicles filled with fat
instead of serous fluid. These vesicles may be the origin of
diseases, such as wens which contain a mucous or serous
fluid. These vesicles ^{act} chemically on the fluids which surround
them, absorb them & give rise to tumours

The second Variety is of great importance - it is the basis
of the vascular system & claims our first attention in the
study of the organs belonging to this system. The inner surface
of the heart in contact with the fluids presents a serous ^{effusion}
If we begin with the veins in their minutest branches &
trace them into the heart. We ^{find} the serous lining extending through

Aug 17th

Angial Tissue of great importance - the basis of the circulatory apparatus. We have seen general circulation & venation & but there was an organ in order to understand the pathological state of this tissue, minute anatomical knowledge necessary, As the vitality of every portion of the body depends upon the supply of blood, it must be supplied with the fluid - it is distributed by the angial tissues. Wherever there is blood there is a vessel & the vessel has been constituted by the blood. The most essential element of the vessel is the portion of contact with the blood, the other portions are limited in their uses. Continuous throughout - It is an elementary tissue & seems to have distinct characters. It is analogous to the general structure of serous membranes - but we cannot by the microscope discover ^{in it} the elements which compose the latter. Supposed by Bichat to be an epithelium - not true - It differs from epidermis in possessing vitality, & being subject to disease - There is the heart, there is the lymphatic & capillaries - the transparent & have cannot be perceived in the capillaries, & don't suppose that redness exists there, but that the blood penetrates through the tissues & water through the soil. We only know that the blood circulates & definite blood but that we cannot see. It is exceedingly fragile the difference from serous tissues - lyaline around vessel back it - it is easily united & reformed; sometimes found opaque - in the pachy derma & red not naturally so in some parts. It putrefies later than any other tissue yields to gelation when boiled (diff for serous) when burnt emits a odour like horn. In the interior of organs, it is so I should think the blood

out their course & continuing uninterrupted into the heart
& from thence through the arteries into the capillaries, which
last are formed entirely of this tissue. If we examine an
egg we find a thin membrane surrounding the yolk
& in the centre of this membrane ^{germinal North (point)} a vesicle which is the
origin of the life. This vesicle ^{from} ^{~organizable matter} with the surrounding fluid
forms the ^{embryo} protogenous membrane. Before the exhibition of
these vessels exist in every part of it, as soon however as
vital action commences, they arrange themselves into masses
leaving interstices between them, which are filled with a
gelatinous ^{not yellow} fluid containing
globules of blood: this is the first step in the formation of
the vascular system; a lamina is next formed, lining these
channels & converting them into vessels. This lamina is an
angular ^{any} serous membrane. In the third drawing exhibited at lecture
of Nov. 18th is seen an outer ring: this is called the venous
circle. The fluids destined for the support of the embryo, do
not pass directly into it, but first enter the venous circle &
from it pass into the embryo by two vessels, one at the ^{head} ^{any to}
head & the other at the abdomen. This takes place in the
formation of all animals - The capillaries (drawing exhibited)
are formed of serous or angular membrane. This membrane
precedes & regulates the formation of all the others.

is scarcely separated from the surrounding tissue - It loses its independence
seems to form part of the structure, but when it passes from the organ it
acquires an independent existence & here other tissues are added to the
arterial, as the elastic fibres & the arterial plasma & muscular
tissue - First found is a membrane constituting channels for the blood -
The membrane swells out in a particular part & is called the heart -
A membranous division is found & valves by folds of the membrane
by the addition of muscle the heart is formed - In some of the lower
forms of animals there is no heart, the blood is spread over the entire
surface of the body - but in the higher orders such a simple
arrangement is not sufficient, therefore a particular organ is provided for ac-
tion & an apparatus for circulating ^{the blood} it is segmented - In some of the
articulata each segment has a sort of heart so that the circulation
cannot be entirely stopped by any motion of the animal
Function of heart & arteries function of elastic fibres tissue, The
arterial tissue is smooth & lubricated by a peculiar secretion so as
to prevent friction - The arteries ramify & terminate in veins
which combine & form trunks, In the venous part of the circu-
latory system, the arterial tissue is enlarged in a manner
similar to that of heart, folds of the membrane act as valves, which
oppose it - The arterial tissue is reinforced by a fibrous coat very
slightly elastic - The veins are distended with a force & again contract
which shows the elasticity - By the following arrangement

Nov. Dec. 2. 1839

It is a matter of importance in the study of the anatomy or physiology of an organ to commence with that portion of it which is first formed, as it modifies the successive formations.

Thus in studying the vascular system, we commenced with the capillaries, which give rise to the larger vessels; the latter being followed ^{by} the formation of the heart. All that we can learn of life is the series of ^{its} phenomena & not its first cause. Therefore we must commence with the formation of the embryo & trace the phenomena as they succeed each other in the progress of life. When life commences the spherules of the plastic matter arrange themselves so as to form numerous capillaries presenting a reticulated appearance; in them the globules of blood are first seen of a yellowish colour. This reticulated mass then becomes vascular by the formation of a serous membrane, ^{which is formed subsequently to the blood} these small vessels terminate in a larger one in the foetal membrane which communicates with the embryo. These capillaries by their union form the larger vessels, which are followed in the order of formation by the heart. The whole vascular system being one closed sack of ^{arterial} serous membrane. The capillaries are formed by the ^{arterial} serous membrane alone; but when these unite & form the large venous trunks they require additional strength.

part of circulation is divided among different parts -

The most important ^{part} of the system is the capillaries - of two
first 1st minute arteries & veins & an intermediate set
of vessels & what the former terminate constituting a rete -
2nd the web of the frog foot & interesting was how the simplest arrange-
ment of the capillaries - The current of blood can be seen by the mean-
s of a dark illumination is shown between the veins
& arterial capillaries, smaller makes a ^{loop} - another inter-
twines shut & becomes continuous with another - But in other parts
they melt down into capillaries without veins communicating
this, capillary rete communicates on the other side with a vein
There is no pulsation in the capillaries, but the current moves on con-
tinuously, except where the current is nearly dead the flow in the ar-
teries flowing backward & forward. The capillary vessels have a
considerable diameter which is uniform - They anastomose & com-
municate but never diminish in diameter - The minute veins admit
two or three globules at a time. The capillaries never more than one
The arteries diminish as they ramify & the vein curve as they
reunite; & so on with the capillary network - In the arteries
the blood moves toward the heart & in the veins toward the heart
in the capillaries it circulates in different directions
Sometimes going round an island formed by the union of the arteries
It is still a matter of dispute whether these capillaries have a proper end or
are mere channels in the tissues - All that can be seen in the blood when seen by a microscope is that it

in order to be enabled to contain the fluid which flows through them
On this account the veins are surrounded with a fibrinous tunic.
Into the arteries the blood is propelled with great force & the
venous structure would not be sufficiently strong to withstand it
It is also necessary that the impulse given to the blood should
be kept up: hence the arteries are invested with an elastic
coat. The heart has to give motion to the blood contained in
these vessels; therefore it is invested with a muscular coat.
The ^{arterial} veins tunic is the essential part of the system
& runs through the whole, the others are merely destined for
particular & partial uses. The Lymphatics are also formed of
venous tissue: they commence with very minute ramifications
which unite & empty into the larger lymphatics & hence are
supposed to be hollow; ^{similar in appearance to} others terminate in the trunks
of ^{large are supposed to be} nerves. In the reticulated structure the blood is placed
at the disposal of the various tissues. They thus derive their
nourishment from the blood which contains the elements of all
these tissues. The arrangement of this structure differs for the
different tissues: thus for the nutrition of the muscular
tissue the arrangement is not the same as for the nutrition
of the nervous. ^{for the} muscles the arrangement is longitudinal
Sometimes they are arborescent, ^{in various membranes} sometimes in a ^{unifurcated} form
The higher the vitality of the organ the longer must the blood be


It has been supposed by some that the capillary system is the same
everywhere, no idea can be more erroneous; for every tissue has its
different, so that one well acquainted with ^{it} can tell by examining a
specimen of tissue, to what ^{part} it belongs -

It cannot be separated from the cartilages on the heads of
the bones but is supposed to be there ^{1st} from the fact that serous ^{elsewhere} membranes
are always closed sacks & 2^d from the secreted fluid on those portions
where joints the membrane projects into the joint enclosing mops
of fat supposed by Haver & Ryland's secretory apparatus in
called glands of Haver -

The ^{capillaries} & arteries are arranged in a plexus, the intermediate ves-
sels into a net or lacunae of peculiar form for each function
they present us with the physical explanation of the acts of life.
Each organ in its distinct existence, susceptible of life & function
made of nutrition & all correct views of pathology must be
based on this. The capillary arrangement of each organ is the struc-
tural ^{superficial} type of its characteristic function - The capillaries are divisible
into distinct orders - there ^{are} 6 classes, of 18 orders, ^{each} of the
1st & 2^d class, & 11 orders - All that is necessary for the phy-
sician is to know the principle without the minute detail
In muscular tissue there is a lower net - muscular arteries in ^{muscle} organs
Dendritic in some membranes -

keeps in contact with it (this law is universal): hence ^{the number of vessels is} ~~no different~~ ^{no difference in} arrangement. Then ^{are} two classes of minute vessels the Capillaries, & Intermediate vessels which ^{unite} ~~unite~~ the venous & arterial capillaries. The Intermediate vessels present the alveolated appearance.

The capillaries are ~~abundant~~ ^{in relation to the function}

The next form of dense tissue is the Synovial; this is solely applied to facilitate locomotion; wherever one part moves on another a synovial membrane is found. From this the synovial fluid is secreted which is very efficacious in diminishing friction. It is always a closed sack & a joint covers the heads of both bones  The outer stratum is fibrous ^{dense cellular tissue} ~~consists~~ ^(comprising) of lymph: nerv: tubules & a small portion of sang: capillaries.

The next is composed of plastic matter. The third & innermost exists is a horny epithelium & consists of collapsed vesicles. The loose mucosae are ^{formed} of synovial tissue.

The next class of serous membranes is that which belongs to the brain & the senses. It resembles the first form somewhat, differing mostly in the size of the cavities formed. It neither secretes a halitus as is the case with that belonging to the brain or a fluid as in the eye.

We have seen that a direct communication exists between the arteries & veins through which the blood circulates without distribution. This is of great importance as when a part is inflamed or the ^{sets} capillaries in it become obstructed the blood passes through the capillaries & is thus retained in the circulation - When congestion takes place in any of the internal viscera - the blood is thus withheld.

They are not found in the capillaries, they are purged from & strong as the plasma which sustains the upper tissues of the lungs it facilitates the movement of the lungs in the chest, but adheres & does not interfere materially with the action, except in the case of the nephritis.

From the circulation a great proportion is the congestion - The congested organs suffer from the stagnation of blood & the heart receives sufficient stimulus scarcely acts & the other organs are not supplied with blood - You have seen that there are inlets of organic matter surrounded & permeated with a rete of capillaries, but there must be also an infinite number of smaller capillaries which circulate only the serum portion of the blood, thus it appears that the greater portion of organic matter is fluid - These inlets have no fixed size - the higher the organic function of the part the smaller the inlets - in the lungs they are smaller than the capillaries surrounding them, thus it appears that the higher the vital action of an organ stands, the greater is the proportion of fluid.

Decr. 3rd 1839

The serous membranes of the senses are formed of three strata
first of minute vesicles, fine capillaries, & lymphatics ^{& nerve tubules} & of
plastic matter. Third of an epithelium of collapsed vesicles.
The membranes of this class are the lining membrane of the
ventricle of the brain, of the vitreous & aqueous humours of the eye
lining the floor of the cochlea & the auditory nerve part
of the ear & of the alveolar processes of the growing teeth.

The 5th Class of serous membranes comprises the Splanchnic
enveloping large cavities. They are all closed sacks
except the peritoneum of the female which is pierced by
the Fallopian Tubes. The secretion of this class seems to be
exhaled as a vapour & to exist on the surface with the form
of dew. It is prevented from accumulating by being absorbed.
This membrane consists of 3 strata. 1st Dense cellular
tissue 2^d Plastic matter 3^d Epithelium. The outer coat
is of cellular tissue & consists of numerous cells or vesicles filled
with a dense fluid. The capillary vessels of this membrane
are dendritic & the rete is a looped form.

In the second layer the Lymphatic vessels are so numerous
as to seem to form the membrane. They arise partly from the capil-
laries of the plastic matter & partly from the serous vesicles
of the cellular tissue. The nerve tubules have the same double
origin. The vascular structure of the plastic stratum is in

Which accords with what has been said - that the vital force acts
on the fluids, the solids are the product of this force -
Every organ presents the result of this force - & its capillaries are
evidence of the capillary force - The physiological
autonomous truth then concerns that every organ is a vital
being - When 6 classes of capillaries are dwelling out all
in the Affection & 18 sub-divisions speak eloquently of the
vital force - When in the capillary structures -
vital activity - the blood, the vital fluid - & the organs
within the product - also seems to regulate this move-
ment - The explanation of venous by vessels, inflammation
the result of an action of them is hypothetical - The action
is so fine that a physical action can be exerted by them
they are so fine that the blood may be considered to be
spread out in a gossamer sheet of many thousand feet
The action of vital forces is molecular & even this minute
division actions take place which could not in the mass -
It may be compared to the action of gases in a nascent state
If blood be drawn for the arm it will take a long time for
the air to be in the pellucid of it, but in the lungs it will
take a flash of lightning - The circulation of the blood is com-
pleted by mechanical means as in the least arteries &
veins - fully vital - the pericardium attracts the blood

contact with the cellular stratum

The epithelium, which is the inner membrane is smooth & has no visible pores, so that the ^{serous} exhalation passes through by the process of exosmosis. The

The membranes of this class are the Arachnoid of the brain & spinal marrow, the Pleura, Pericardium, Peritoneum & Vaginalis Testis. The inner surface of the Arachnoid invests loosely the Pia Mater, on the outer it adheres to the Dura Mater. Its uses are to permit the movement of the brain within the cavity of the cranium. If the brain were attached to the ^{sudden} forities of this cavity every motion of the body would be liable to produce concussion: which takes place only in severe falls & blows, causing insensibility & sometimes death without any apparent injury of the brain. Disease of this membrane affects materially the comfort, intellectual functions, & often the life of the patient. In cases of inflammation of the Arachnoid membrane, the patient on attempting to walk or on the least motion feels a severe pain in the head. Probably the same effects are produced in the spinal marrow. This membrane secretes a fluid, which Mejerdie says moves from the brain to the spinal marrow & vice versa & that this motion is essential to the healthful action of the organ. Upon tapping the spinal marrow of a dog so as to let out this fluid

fitted to its nutrition & repels it again - It is possible that the
phenomena of organic as well as inorganic life, depend upon attractive
& repulsive - & it is for this analogy that the forces of life have
been referred to magnetism & electricity - There are indeed
physical & chemical forces at work in the economy, which
be in the capillary circulation, ^{perpetuating effects} forces which cannot be referred to
any known physical forces - Our pathological views & ther-
apeutical agent must be based on this doctrine - all hypotheses founded
upon contraction & expansion of vessels must be wrong -

Is it not possible that

Perhaps persons are related in cases of fainting by their heads
being held lower than their bodies on account of the flow of this
fluid from the spinal marrow to the brain?

Sat. 25th

Lymphatics composed of areolar membrane, with an external
membrane of fibrous character very thin & slightly elastic - They
are widely diffused throughout the body - Macassar & some others
think that some lymphatics are wholly composed of this areolar
membrane & Bonnier thinks that they commence by first taking
in the cellular tissue, in two forms, tubes & rete - (plate of
rete in skin) differs from sanguine rete - The rete resembles
sanguine structure, this rete which may be considered the origin
of the lymphatics, is more superficial than the sanguine

The animal immediately sank into a state of insensibility. It is the opinion of most physiologists that this fluid may accumulate so as to produce compression: but Majendie ^{thinks it is not a pathological condition,} says that it does not produce compression, that it only accumulates as the quantity of blood in the brain diminishes & vice versa. The quantity of fluid increases in cases of atrophy of the brain. Delicate persons faint when their feet are immersed in hot water on account of the immediate sudden withdrawal of blood from the brain. The same effect would be produced by a gradual withdrawal of the blood if it were not for the corresponding increase of this secretion.

D.C. thinks it probable that inflammation of the arachnoid membrane is produced sometimes in young persons by mental efforts disproportioned to their years.

There are three serous membranes in the cavity of the thorax viz Two Pleurae separated by the Mediastinum, & the Pericardium.

The Pleurae not only assist the motions of the lungs, but are required to give support to these organs, therefore they are more dense than the Arachnoid membrane. In the Pericardium there is further modification; it is reinforced by a fibrous membrane which enables it to resist the violent action of the heart in cases of disease. The Pericardium is a serous sack within

[illegible]

a fibrous one. The free surface of the heart is essential to its function, and in case of adhesion the embarrassment is great & the patient usually dunks under it.

The cavity of the abdomen is lined with the Peritoneum, ^{the largest of the serous membranes} which is reflected ^{to attach them to the parietals of the abdomen} over many of the viscera so as to give them a smooth serous covering, thus enabling them to move without friction. There is in this cavity thirty feet of intestine packed together in a small space. Motion is necessary for its functions. This is accomplished ^{by} with the aid of the serous membrane without the knowledge of the being to which it belongs; but when inflammation of the peritoneum occurs, every movement is accompanied with great pain. In cases of peritonitis respiration is carried on entirely by the ribs, on account of the pain caused by the motion of the diaphragm, so that the physician may detect the disease at the first sight of the patient. We have now seen how important are the functions of the serous membranes, how dangerous its diseases. The serous membrane ^{varies} differs with age. In the foetus the abdomen is lined with a mere coating of plastic matter which invests the intestines as they are developed. From this state the serous membrane is gradually developed and acquires its greatest perfection in adult life. The higher the order of the animal the greater

The diseases of the venous system have a special character & that the
general description answers for the whole but there are like
some a set of special symptoms belongs to the organ with
which the venous system is connected.

Of doubts dispute. Before the discovery of lymphatics, absorption was
attributed to the venous; after this it was ascribed exclusively to
the lymphatics which were called absorbents, but experiments
of Magendie & Ferriar & repeated by Harlan & Coates show that
the venous likewise absorb. Absorption is not confined to any
system of vessels but is performed by all tissues - ^{coats of vessels} of the
thorax & the circulation - But there is something more; there is
the lacteals there is a form of circulation, they do not absorb in-
^{directly} directly all matters, but only the matters formed by the process of
chymification ^{digestion}, coloring matter, odorous matter & medicinal sub-
stances are taken up by the veins of the intestine & return into the
circulation - The function of lymphatics seen to be ^{to take up} to take up
nutritious ^{preparations} matter into the economy. ^{they take up} They contain lymph
thick. The blood ^{obtained from the arteries} deficient of its globules, & return it into the venous
system. They take up effete matter which is returned into the veins
& eliminated from the economy - They may receive other fluids
but there are some hypotheses, those, tubercles and other

is the development of the serous membrane. In the insects it is altogether wanting & reptiles very imperfect

Pathological conditions - There is no class of diseases more frequently met with than the affections of the serous membranes. In a natural state they are insensible: but in disease sensibility is rapidly developed; sometimes in half an hour a membrane becomes very painful. When inflamed they become highly vascular.

The most important modification is inflammation. It may be acute or chronic. It may be excited by wounds which expose to the air; hence the danger of opening serous cavities or from causes disturbing the functions of the superficial organs. For instance the action of cold upon the skin.

Inflammation of the Serous membrane is induced by mental too early application to study & an excessive exercise of the intellectual faculties. The acute inflammation of serous membranes is characterized first by external symptoms

2^d, by physical signs, auscultation & percussion

3^d By Anatomical signs

Callous
is it physical or vital? Possibly the
has been found within - What is the power? What the fluids are propelled? - doubtless

has been found in the batrachian pulsating snakes which circulate the fluid
but why has been discovered by it in other animals - But we see in reptiles the
the cap is circulate with a physical force & we may deduce from analogy
that therefore the same with the fluid of the lymphatics

The most important function is motion - As soon as inflammation occurs
the is impeded, the center is altered & the smooth ~~movements~~ ^{movements} lost
Constitutional symptoms are produced by these inflammations - as in phlegm
& peritonitis

x Of the three is no proof ^{what by term} as a pleurisy the pain may be
sent in one of the other spaces - the early the pain ascends
by pressing the fingers between the ribs - though not remarkable
is exceedingly sensitive & prone to inflammation -

Dec. 5th 1839

Pathologists formerly were surprised that serous ~~serous~~ membranes which appeared to be so ^{slightly} little organized, should be so liable to disease. but now that we are well acquainted with ~~their~~ structure we can easily account for these modifications. The principal modifications of serous membranes are Inflammation, Effusion & Tubercular Depositions which sometimes have the character of transformations. Inflammation is ^{productive of} recognized by ^{or is the result of} Physiological signs, Physical signs & Anatomical lesions. The most common physiological sign is pain. In health serous membranes possess no sensibility but it is very rapidly developed in disease. Inflammation so modifies the surface that the parts no longer move without friction & the pain becomes acute & lancinating. There is a set of symptoms belonging to each of the different membranes. Thus there are peculiar symptoms belonging to inflammation of Arachnoid membrane so also to that of spinal marrow, of the eye &c. Sensibility is suspected to be sometimes developed as a neuralgic disease without inflammation. Physical signs generally are not applicable to all serous membranes. There are some however which enable us to detect diseases of these membranes.

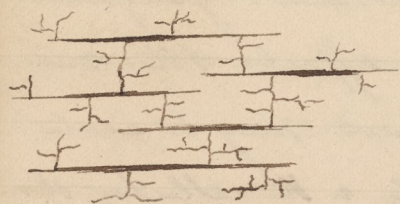
Pathological conditions of Anginal Nerve

1st of heart of *Rhyssompterus* - *Graciliter* - Most common condition is inflammation - acute & chronic - closely analogous to some inflammatory condition called endocarditis - common occurrence, difficult to recognize - 2nd alteration in colour - transparent in early life, white in advanced stage - marked in inflammation, the appearance is deceptive, sometimes arises from indurated inflammation. The valves present capillary injection, adhesion or perforated, when there is a case - it is marked over you may take it for granted that there has been inflammation - Plaster lymph is also thrown out, this is positive evidence, in chronic inflammation the membrane is thickened - the same structure can be easily peeled off as a positive evidence. These anatomical appearances are only important as connected with certain symptoms in life - Occasional there is erosion & ulceration - the latter doubtful or at the junction, occurring the upper, erosion common - affects the valves - I have already the veins of the extremities pulsated when the arm was held in a horizontal position & put motion showed that the exposed valves were destroyed - The observations made in the appearances of inflammation - the heart applies to that of the arterial system - Most usually one degree of insensibility is developed, they are profoundly cold, & accompanying fever & slow inflammation & an opinion has lately been put forth that the may be produced by the clot of the blood, which contains a great deal of fibrine, as much as 8 or 10 parts in 1000. Inflammation more common in left than right ventricle, which accounts for the changes the membrane of the two sides were different in their structure, this is probably arising from the different character of the blood - the sides

A lapping on the head or a concussion gives pain in inflammation of ^{the} Arachnoid membrane of the brain. In such a case of the Pleura Percussion & percussion are the means employed. A dullness on percussion is produced ^{by} effusion in the Pleura: If it be inflamed there will be a sound as of the rubbing together of two rough surfaces or a creaking when the pleura is dry. In pleuritis there is also a condensation of the resonance of the voice. The motions of the heart produce the rubbing sound in inflammation of the Pericardium. Anatomical lesions show us after death that inflammation has occurred. The membranes become thickened, opaque & reddish. There are layers or rather granulations found on the surface. Some physiologists deny that thickening of the membrane takes place, affirming that this increase in thickness is produced by a deposition of matter; but it has been found to take place in the Plastic stratum while both the surfaces have remained natural. Suppuration may take place ^{in broken inflammation}. Ulceration is of very rare occurrence & never originates in the membrane. Gangrene is also very rare & is never ^a original affection of the membrane. Inflammation of serous membranes may be acute or chronic. It commences invariably in the cellular stratum. It is at first indicated by red spots: then gradually extends

If the patient is robust & his blood plasma the serum contains
a great deal of plastic lymph, which is deposited in a thick layer
if the patient is reduced then a much thinner & white lymph

Besides inflammation, this membrane is subject to softening
& occasionally an effusion of blood.



Formation of vessels in plastic deposit

and the redness assumes an arborescent form; red lines are seen to extend into the cellular plastic stratum & at last the redness is diffused over the whole membrane (very rarely)

When the inflammation goes on for any length of time an ~~effusion of plastic matter takes place in the surface~~ ^{effusion of plastic matter takes place in the surface} & the serum fluid is collected in the cavity. As the Plastic matter settles it involves the serosa & is at first glutinous but is subsequently becomes dry & membranous. If the serosa be highly plastic it will agglutinate the adjacent membranes & form adhesions. If the plastic matter be deficient in the serum it will form bands on the membrane. In effusions on the pericardium, the plastic deposit is made rough being drawn into points by the alternate approach & separation of the surfaces, ^{caused by} in the action of the heart.

A red spot first appears in the plastic deposit, then vessels are formed which communicate with the vessels of the adjoining membrane & the plastic matter becomes organized, after which the red blood disappears & the membrane loses its colour. This organization is independent of the adjacent vessels. There is a doubt about ^{the mode of} its formation of these vessels but it seems to be similar to the formation of vessels in the proligious membrane, plastic matter being always capable of organization.

X Endocardium also subject to calcification & open transformations
then may be found out of disease or may give rise - also subject
to a peculiar disease called atheroma, a marbled sylvan appearance of the
external azygial membrane doubtful whether it be a deposit of pus
Disease of valves: valves constituted by fibrous bodies, or rings over which
flexible membrane is stretched - the arduous, are fibrous expansions from
the ring between the two coats of the valves - into the thin chordae tendineae
are inserted - The effect may be either on the chordae tendineae or the mem-
branes proper to the arduous - The portion of the mitral valve towards
the ventricle are often affected more than any other part of heart
Alterations 1st attended of colour & thickness - whitened & of form
latter attended with great disturbances of circulation - The surface
becomes calcified or fails to close - the blood regurgitates & a ϕ
Synovial membrane when divided is readily united - subject to ordinary inflam-
to thickening from chronic infl - Gout & rheumatism produce enlargement &
thickening to such an extent as to prevent motion: Gonorrhoeal infl. some-
times takes place in these membranes often being suddenly cured in its origi-
nal situation - Often affected with arthritis & rheumatic infl. w. redness
swelling pain, followed by thickening & not so frequently deposits of uric acid
more frequently attacked w. gonorrhoeal infl. than the thoracic & buccal - Some-
times medullated deposit of pus, in some cases without alteration of membrane, spread
by the lymphatics - There are some cases which can be ascribed to the lymph-
atics slight injury followed by pain & loss of function, a body hurt the hip & thigh
no fracture could be detected, the disease was all the while thought to be joint was morbid

Inflammation produces different effects in the different serous membranes —

1st It occurs in the serous Membrane. The first change which takes place is in the rete & capillaries. The rete which in a natural state transmits only white blood, first shows red spots & then becomes red throughout. If it extends to the veins Phlebitis is produced: this generally proves fatal from the production of pus & vitiation of the blood. It often occurs in child birth, inflammation taking place in the vessels concerned in parturition. Arteritis is more rare than Phlebitis being in the proportion of 1 to 20. It is an obscure form of disease. The membrane lining the heart sometimes becomes inflamed producing endocarditis.

The Synovial Membrane is subject to inflammation producing a swelling of the joint from effusion. It occurs very rarely from cold: ^{may be produced by injury} and is generally brought on by over-exercise. Dr I saw a woman (a milliner, accustomed to a sedentary life) who was attacked with inflammation of synovial Membrane after walking five miles. Perforium horses are often attacked by it also soldiers after a fatiguing march.

Inflammation attacks the serous membranes of the Joints. It occurs in the capsule of the aqueous humour

capular effusion probably commences in bone -

Inflamm of Arachnoid sometimes exceedingly local being con-
fined to the upper, lower or internal ^{ventricles} portion of the brain
I saw a case lately of a child who died from a fall from an omnibus
the inflammation being the ventricles was alone affected
x There is great disturbance of the digestive & respira-
tory functions - distress from pulmonary oedema - there is a
very backing cough - the respiration sometimes high, sometimes low
laboured or slow constantly changing - It is a very common occur-
rence with children - Fatal results may take place (& I think
they often do) from effusion producing compression - Death
however generally is produced by diffuse inflammation with
effusion when then case the pericranium itself is usually affected
The inflammation is capped over of brain, the ventricles
however are rarely disturbed, but the respiration & digestion
are very much so, I have known a chronic arachnoiditis continue
for years, commencing at an early date - two of these were my
scholarship when I first knew them - they were subject to
fevers, almost constant headache, they died when at

producing ^{crystalline} of the vitreous humor ^{sometimes} producing cataract. Glaucoma is a inflammation of the membrane enclosing the Hyaloid humor it causes blindness

Inflammation of Glaucomic membranes. It attacks the Arachnoid of the brain & Spinal marrow. Arachnitis of the upper hemisphere produces delirium. When it attacks the base of the brain, there is no disturbance of the mental faculties. It may be known by the following circumstances. A child affected with it, though naturally good tempered, becomes cross & fretful & frequently wakes from its sleep sometimes screaming out. It will be playing very cheerfully & suddenly cry out. The pulse is not affected. A frequent symptom is a slight dry cough. This is caused by the disease extending down the spine & affecting the nerves which go to the lungs or bronchia. The face is usually flushed. When these symptoms occur we may be sure of Arachnitis & should proceed immediately to arrest it. Leeches should be applied around the base of the brain; this will generally afford relief. I have seen the symptoms disappear after the loss of a few ounces of blood. If the remedy be not applied in time the patient will not probably die -

Arachnitis of the Spine produces paralysis If it occurs

age & on examination there were found evidences of old & recent
inflammation: of the latter they said - There was a gentleman turned
in pain in the head on taking exercise being advised by his phy-
sician to travel he went to Europe & returned & on coming home
he was perfectly at ease but on commencing his journey
intense pain was produced - In fact that is the case in which
pleurisy is not prevented the great motion of the brain: consequently
very great pain is produced - When the serous coat of the pericardium is
inflamed there will be spasms of back & limbs but there is
not pyrexia as there is in other affections -
Inflammation of the pleural membrane produces effusion
of the matter of the brain & pleura - In the membrane of the
apex of the lung effusion of lymph or pus - by the mem-
brane of the lungs, & therefore the fluid is thickened by the
effusion of lymph & the membrane are united & therefore
the lung is - when the membrane is thickened by deposit
of lymph in the deep results have an active work
which is required - Pleurisy seldom occurs alone usually
in pleurisy pneumonia - the local act of much danger, but
when general it is so - When water in pleura comes, despite
the latter is a continual movement & the pain is intense
The fact can thus I saw yesterday a boy with the pleurisy
& in the pleura the patient is not able to lie down

in the upper part of the Spine the arms & head are affected the head is generally drawn back. if about the middle, the Stomach & liver are affected: if in the lower part the lower viscera & lower extremities

If Pleuritis occurs at the upper part of the chest the pain is very slight because there is in that part little or no motion of the lungs, if in the middle the pain is much greater. If the diaphragm be affected the pain is intense. In the last case it may be relieved by a line of cups along the edge of the diaphragm whereas the cups applied above or below would be of no service. A blister applied along the same line is also beneficial. Physical exploration is the only means of ascertaining chronic pleuritis, the patient being unable to fix the seat of the disease, & frequently overlooking

Inflammation of the Pericardium is sometimes associated with pleuritis. It is often complicated with rheumatism. In pericarditis the motion of the heart is reduced to the lowest possible motion. Instead of pulsating with a full strong action, it scarcely moves, hence the small feeble pulse in this affection —

It is to be very careful with scarlet, purplish spots, if well being a tubercular disease often in any predisposition the disease

I saw a case of boy whose mother had given him a drastic cathar-
tic for constipation, purgative followed; the boy was emaciated.
I gave him a mild cathartic & the effects returned & ultimately
remained. I have seen it frequently in the Blackmore, & have
seen from a cathartic before delivery, when I attended such
cases, the action of the uterus & abdominal muscles perhaps
is not inflammation, the cathartic brings on these strong
cramps for expelling that which is to be seen through a partial
proof of it — Lymph is thrown out in large quantities, I
have seen the intestines glued together in one mass this action
is violent, & when he provides for the case the expulsive
force, the abdomen for full, quick & the bowels contracted
pain produced by motion & the hardness of the part which causes
a sort of paralysis of the muscles — the mother near of even provided
by nature, however I have given purgatives & labor few with
the greatest effect. We can attack the inflammation of the
membranes, by depletion, Mercurials or Castor oil & not to be
used as we frequently see persons emaciated in a few days
out of health — I suspect fever is usually the first & deepest
in inflammation, I saw a case of death from the effects of the pur-
gative in a few days after delivery — the pain had been high
I think that there must have been a case of phlebotomy — but
after delivery, there is great pain which subsides after days

Peritoneum subject Dec. 9th 1839 to very acute inflammation
Inflammation of Peritoneum is sometimes produced from
by blows & I believe in some cases by dusts in the
exposure to cold. It is also a frequent affection in women
after parturition. Under the latter circumstances it sometimes
an epidemic form, nearly every woman who brings forth
at the time being affected with peritonitis. It is generally, how-
ever, accompanied with inflammation of the vessels of the Uterus
causing death although the inflammation of the peritoneum be
slight. Peritonitis is sometimes chronic coming on insidiously
by producing effusion of serum or gas. The physician in these
cases should be very cautious in his examinations. The late
Lady Flora Hastings was a case of this kind. Sir Jas
Bloss has lost much reputation on account of his incorrect
diagnosis. Warranting the belief of her pregnancy. A post-
mortem examination showed that her affection was a chronic
Peritonitis. Sometimes adhesions are formed without the exter-
nal symptoms being such as to lead us to suspect their existence.
The next class of diseases includes effusions in the serous membranes.
A serous fluid is secreted by these membranes during health whi-
ch serves to diminish the friction of their surfaces. This secretion
increases very much & not being absorbed constitutes dropsy.
One of the effects of inflammation is an increased secretion
the serum gravitates to the lower part of the cavity & the plastic

As probably a neuralgic affector of abdomen

Chronic peritonitis is exceedingly common. It is usually in the city treated by a radical puncture for issue of pus, & the more profuse the discharges of pus, the better the result. The incision is placed together. — A man came into the hospital who had walked a long distance — complaining of pain in the lower part of the abdomen, with a fever, & the bowels were not open. He knew he was not well & returned with a pain in the hip — he did not pay much, & chronic peritonitis was found to have placed the abdominal cavity together. He then came to the city, & Dr. Ross gave him 12½ anacardium, & about the peritonitis could be detected. The abdomen feels like a mass of folded leather —

Purulent Sometimes occurs, by which I mean of pus without inflammation as can be seen in the case of a man who died of the same kind. The right pleura & peritoneum were filled with a pure limpid fluid. Such effusions arise from obstruction of circulation & improve with an action of the blood — especially after the pleura. The latter stage of phthisis, it is a frequent occurrence just before death —

matter is deposited as a layer. In a person of lymphatic temperament a slight inflammation produces a copious effusion containing little plastic matter. One in an emaciated state suffers in the same way. This shows that the state of the blood has a great influence on the character of the effusion. Sometimes without inflammation a rapid effusion takes place, causing death. Two years ago a patient at the Alms House who had been labouring under intermittent, had apparently recovered & obtained permission to leave the house. The day before he was to leave was very damp. During the morning he walked about the yard & in the evening was attacked with a difficulty of breathing. Dr. J. was sent for but the patient drew his last breath just as he entered the room. Upon examination after death both pleurae were found to be filled with a clear limpid fluid resembling ^{the pleurae in a dry state} spring water. If his blood had contained the usual proportion of fibrin inflammation would have taken place; but his blood being thin & impoverished a copious effusion was produced by the first irritation. Dr. Webster used to relate the case of a boy who becoming fatigued while skating had thrown himself on the ice. He was soon after seized with a pain in the abdomen. Effusions arise from affections of the serous & serous membranes. In some diseases of the heart the serum is effused through the coats of the vessels. In some cases a

Chung's pneumonia consists in thickening & whitening or the formation of yellow spots: these spots are thought to be points of organization. They are generally found in the left side. The area may be transformed into cartilage where no vegetation may grow for the lungs - Some think the cartilaginous the first step of the process - When the vessels are very thickened but slight disorder is produced, but when cartilaginous or ossified great derangement must attend. The disturbance in motion

x I think it sometimes acute, sometimes chronic - he saw a patient attacked with symptoms of acute arthritis of the chest. He recovered but died several years after & on examination thickened vessels were found as great that persons thus affected are condemned to death of course - Vegetations are of a warty appearance & occur not only upon the valves but upon the sides of the cavities - These are the low when early the signs of the affection are local & general former detected by auscultation. Bellows sound indicates the least degree of alteration, the pulsing - rasping, sawing, & musical. Bonelland thinks the best to indicate great contraction. Then sound & the cancer still require study & observation - The bellows sound is not always attended with greater alteration, it may be produced by various derangements - A gentleman applied to me upon an alarm having been told that he had disease of the valves of the aorta, while applying the bellows a strong bellows sound was heard - 120. While lying it was 80 & the marked sound dropped

coagulum being thrown out obliterates a vein & Dropsy follows
Dropsy is produced by many diseases by which the blood is
rendered thin & the serum is effused. Effusions in the different
membranes take different names. ^{Dropsy}Effusion of the Viscerous
Membrane is called Hydrocephalus; of the Eye, Hydrophthalmia;
of the chest, Hydrothorax; of the abdomen, Ascites
The next form of disease of the serous membranes which de-
mands our attention is the Tubercular, by this term we
mean a deposition of organized but inorganizable matter
on the membranes. This disease is confined to the cellular space
& manifests itself in various membranes which are a modifica-
tion of the cellular tissue. It occurs most frequently in the lungs
but all serous membranes are subject to it. { drawing showing
exhibiting a tubercular deposit a the peritoneum, which was
red with light coloured tubercles } It is deposited under the epithelium
The deposit in its commencement is probably microscopical
During an examination of a tubercle by Drs Jackson & Gerhard
the part of the membrane not supposed to be affected came in view
& numerous small aggregations of points were observed
It occurred to them that these were the germs of the tubercles
Tubercular matter is a modification of albumen. These tubercles
become very much enlarged & sometimes occupy the place
of a lung. The cause of this deposit is undetermined. Sometimes

It may also be produced by the state of the blood - Chlorotic persons
where blood is thin present this sound - Perry has published a list
of cases, in which he states that out of 50 persons with disease of valves
the bellows or murmuring sound was heard in about 1 in 20 - Thus
it appears that the bellows is present when there is no alteration
of valves & may be absent when there is - Therefore we
must be guided also by general signs - Difficulty of respira-
tion, automatic heaving excremities - cough, irregular pulse
This case of a gentleman with heart diseased, cough & irreg-
ular pulse, was perfectly relieved by a slight solivation - I have
also say that I have seen two cases of actual disease of heart in
which the loud second & irregular pulse disappeared with solivation
I have seen again.
Now - The inflammation from the anatomical signs are similar to
the details of the inflammation of arteries, there is a phlebitis. There is
a great tendency to the formation of pus - Lymph is thrown also a
greatly towards the vessels - This disease is common & is one
of the first form of pyæmia from the pus found in the blood
which arises in the focus of the blood. Is common after operation
It is the usual cause of death after amputation - published 45 cases
which terminated fatally 12 were of the thigh - Phlebitis is another
cause of phlebitis & I have known 5 or 6 cases of fatal termin-
ation from this slight operation. A few cases were of persons who
were in good health. Death took place in from 7 to 15 days -

it is dependent upon, sometimes it is accompanied by inflammation but at other ~~times~~ occurs without it. Its vessels can be traced into it & no circulation is apparent. There is generally an accumulation of blood in the rete obstructed by it, which causes inflammation; but inflammation sometimes causes a deposit of tubercular matter which exists in the blood. Sometimes it is chronic but is sometimes acute & runs its course in a short time. The Dura mater is sometimes affected with a tubercular deposit. This was first pointed out by St. Gerhard as a frequent cause of Hydrocephalus. It is often preceded by inflammation but may occur without it. In its early stage it is sometimes curable but if allowed to run on will prove fatal. It may possibly occur in the Pericardium, but I have never seen a case of it.

Membranes are subject to transformation into Fibrous cartilaginous or osseous.

As we proceed on we find the tissues rising in importance. We have now come to the Dermoid tissue, which covers the whole exterior of the body & gives protection to it. It is a modification of the cellular tissue for we find this latter passing into the dermoid & gradually losing its distinctive character. It is very complicated but its components are modifications of the cellular. It is in contact with the exterior world & transmits impressions

Case of a lady who had a slight headache, ^{last for a bleeding} milder & I saw her a week
after & could scarcely sleep for about 24 hours, the next day she
is nearly putrid & a mass of blood poured from the orifice & the
blood oozed out of every part of the body -

Our views of inflammation are exceedingly incorrect. They are based upon
what has been observed in cold blooded animals - Now what relevance can
be placed upon observation on animals so differently constituted from
warm blooded. Inflammation cannot be produced in this class - and
appearance somewhat similar is produced, the tissues are colored by
exhalation of blood effected by the substance applied acting chemically
Aug 27 / ^{Rebbit} I cannot say that the pathological condition of organs is
constituted by that of the tissue containing & giving direction to
the current of blood, ^{or of the cells of organs, milder} but it is more probably that of the cells of or-
ganic matter.

Inflammation, the first abnormal condition which attracted notice
has been a subject for investigation during all ages, yet I do not
know that we are acquainted now with more than the empirical
facts first recorded by Celsus. The experiment made to elucidate
the subject has been hard enough, the animals experimented
on were cold blooded & not warm blooded. ^{Experimenters} They used the strong
antiseptic agents without reflecting that they acted on
the blood itself. The art of surgery tell us that the capillaries
of the frog's foot contract - because the red particles are repelled -

made by surrounding objects. It eliminates from the animal economy fluids which are no longer adapted to its support; it also gives exit to poisonous substances. The skin is endowed with absorbent & insalubrious properties for substances applied to it find their way into the circulation; noxious gases probably affect the system in this way; Medicines applied to the skin produce an effect on the system.

The elements composing it are first 1st The Derm which is the matrix containing most of the elements constituting its different parts. We see numerous capillaries & nerve tubules entering its base: it contains glandular bodies ^(muciporous glands) which secrete the mucus on its surface, ^{the minute in the dermiform below the papillae} sebaceous glands with spiral ducts leading to the surface & terminating in minute pores, ^{on the ridges of the papillae} sebaceous glands, ^{some} glands terminating in the bulb of the hair follicle. Under the Derm is the adipose tissue from which originates the hair. A third set of organs exists along the outer surface of the Derm producing the colouring matter of the skin, which consists in small imbricated scales; above these the nerves terminate in conical papillae forming a layer. Over the whole is placed the epidermis formed by the hardening of the mucus secretion. The layer of nervous papillae is above the chromatogenous glands whose ducts pass through it & beneath the scales which constitutes the coloured layer.

then are repelled by the fluid (ammonia) applied externally by es-
charotics. Others tell us that the capillaries expand. They pay no
regard to the time of observation, & the effect produced by the cir-
cumstances in which the membrane is placed (removed from the water
& laid on by heat) & heat of 112° is fatal to cold blooded animals.
Latarjet denies that inflamⁿ can be produced in the web of a frog.
John Gendrin asserts that he has witnessed inflammation & suppu-
ration, & that he has even seen the globules being converted into
pus globules - The fact is you may expose the flesh of cold blooded
animal to ^{insect} nature and produce pus & bleed in the wound -
& so pus can be formed - Resorption takes place without inflama-
tion it is similar to that in warm blooded animals when the
parts are in contact - The theory of Wilson Philip that it depends
on the ^{the} sebaceous glands terminating in the hair follicles
on relaxation of the capillaries & on fermentation. Nothing is
known as to whether a web has better sweep than whole
of phyloglossa by the blood, & like, then could what is known
of part before white turns red, then a one fact - a Bled is this
the part is tumefied. & that the temperature is increased.
4th The Sensibility is increased or developed - Water has
the results of inflammation set on before its causes - These
terms apply which produce inflammation differ from each other
& they do not produce exactly the same effect - Cantharides

Decr. 10th 1839

The Pathology of the skin cutaneous system is probably more complicated than that of any other. The small amount of information on this subject is attributable to ignorance as regards its structure. Within a few years great such progress has been made in the anatomical knowledge of the skin as to make known the cause of many diseases; but this knowledge may yet be considered as just opening.

The Composition of the skin is as follows. 1st The Derm 2^d Nervous layer or form of ^{erectile} papillae. 3^d Sudoriferous glands with their spiral ducts passing through the epidermis 4th Sebaceous glands pouring out a secretion which constitutes the epidermis 5th Organs of colour - Chromatogenous glands secreting matter which is now disposed in an intricate form between ^{upon the} the ~~derm~~ & nervous papillae. In the derm are lymphatics & capillaries forming a rete, many of the interstices of which ^{occupied by} are filled with glands. These glands being surrounded with a fine network of vessels about 2 to 3000 of an inch in diameter.

The derm is the most deep seated layer of the skin. It is apparently formed from the subcutaneous cellular tissue which gradually becomes more & more dense until it terminates in what is termed fibrous interlaced in every direction & is a brown substance the derm. In some parts however there is a distinct line ^{separable} of demarcation between them. It is fibrous & to some degree

measures, as since each produces a different effect. There is
a general resemblance, but characteristic differences, perhaps
this may be ascribed to the difference of the tissues - a differ-
ence of the skin - as in the redness (erythema) at the site of
white induration & around depends on ^{the structure of the white rete} the structure of the white rete
I know a gentleman subject to frost who has a burn of the white
swelling temperature high at first the face commencing in the
in the morning & reaching the other by the evening -
The phenomena of inflammation depend upon an efflux of blood
to the part; hence our means of relieving inflammation - pos-
sibilities, bandages, or reduction of the force of the circulation -
By reducing ^{the vitality} the vitality of the structure & thus reducing the
vital activity of the part inflammation is abated - hence can-
dle & cupping the structure & the blood stands still (In physiology
we find that the higher the vitality of a part the greater the flow
of blood through it, Temperature corresponds in animals with
activity of circulation & the degree of organization of the structure -
Modification of temperature corresponds with molecular action
where the action is greatest the temperature is also greatest
when inflammation exists locally or generally the temperature
is raised. Hence we may infer that the higher degree of mo-
lecular action is found in the inflammation & the blood - The
vitality is also increased - When a part is inflamed there is

elastic, requiring however a considerable length of time to return
to its original state. It is the protecting envelope of the nerves &
glands and is formed of fibres constituting a lacwork which becomes
more dense as it approaches the outer surface until it is blended with
one mass with lymphatics capillaries & nervous tissue. The fibres form
cellular areolae containing the glands & vessels. The derm where
the ^{the nerves which supply the skin} neurilemma does not penetrate the derm: but at the exterior
of the nervous papilla is seen a membrane much resembling
the neurilemma. In order to study the construction of the skin
take a piece from the heel or palm of the hand & inject it, then dry
it to ascertain extent, until it is of the firmness of the cuticle. Cut
a very thin slice perpendicular to its surface & place it
under the microscope. With a colored needle the glands can
be picked out & Breschet says that he has taken out the
nerves. The human skin is chemically, formed of gelatine
The derm is soluble in water but insoluble in alcohol
does not putrefy readily & when tanned forms leather
The skin possesses a certain degree of elasticity, which is
^{by great pressure the fibres are stretched then they readily lift after}
much greater in the lower animals than in mammalia
e.g. The Boa Constrictor is able to swallow an animal
3 or 4 times its own diameter. The skin is contractile hence
^{protruding} the lips of a wound separate. Surgeons should recollect
this property when they amputate limbs. The inner surface

present every element of reliability & the latter is correspondingly
exaggerated. Then as the general phenomena of inflam:
it is not merely the distinct phenomena, Rheumatism pro-
duces vesication, Mustard produces redness & increased operability
then I caution you against the neglect of the use of Anopim. I have
known patients suffer ^{pain} for days from a sinapism kept on too long
Tartar emetic produces pustulation -

Feb. 1st Is inflammation to be regarded solely as destruction
or as a great pathological action set up & action health -
Are we to suppress it, regulate it or promote it? These
questions are still unsettled, & I shall be occupied in going further
into the subject. The error has prevailed through the whole age of
medicine that inflammation is an increase of temperature
molecular action & exaltation of vital action, This must be
in part true but it is not the whole truth. The theories on
the subject have varied most fatally, & are confused they have neglected
the exciters of inflamⁿ. External agents operate in vital force
in peculiar modes & have peculiar phenomena as developed -
Inflammation then is something more than mere exaltation of
action. There is something specific, there is a cause there is differ-
ence in the inflammation as there is there a modification of
vital action & well as exaggeration - This has been overlooked
in the formation of all doctrines on the subject of inflammation & fever

portion of the skin is less sensitive than the outer account
less pain is produced by an instrument penetrating for either reason
of the nervous arrangement. Cold contracts the skin: the pores
the nerves are divided into portions in reaction
them for example is very much contracted by cold. This perhaps
is attributable to the diminished circulation under these circum-
stances. The derm itself is almost insensible but the nerves
& glands which pass through it are very sensible & irritable
The confined locality of diseases of the skin is supposed to be
owing to the want of connection between its various nerves
& glands. The skin

The ^{derm} skin varies with age. In the foetus it is ^{transparent & granular} gelatinous
& in advanced age it is denser & firmer than in youth. In ^{all species} females it is thinner & more pliable than in males. It is thicker
in the lymphatic than in the ^{liver} nervous & sanguineous tempe-
raments. It differs very much in different families of animals

In some it is ^{coloured} for defence, in others for ornamentation or respiration - In those which
some families derive its name from the character of the skin.

^{the skin is thicker} Pachydermata to which belong the Rhinoceros, Hippo-
tamotus, &c. In these it possesses little sensibility, in the athermanta &
^{the skin is thinner} Solipedes it is looser than in other families. The wing

of a bat differs from all other dermoid tissue. The derm almost
disappears & it seems to be a nervous (expansion) tissue
It is by the impression of the air on this, that they are informed
of the vicinity of objects. If the eyes of a bat be put out he is
not still be able to avoid any object that may present

have been regarded as an irritant

~~Elements~~ of inflammation - 1st The vital force belonging to the organ itself
which is the seat of the affection (can be removed & distinct of
itself) 2^d the tissue affected, 3^d We must examine the causes
the cause which has produced the inflammation - Particular good effect
of subcutaneous syringes physiologically on lymphatic system, so with mustard
agent, Iodine affect the superficial membrane 4th The blood must
be taken into consideration - wall can of inflammation is become more
plastic, varying from 5 to 10 or 12 parts in 1000. An anemic con-
dition cannot present the same phenomena of inflammation as one
in a plethoric condition, the two cannot be treated alike
5th The state of the nervous power of the part - We know not
exactly what this is, but we are certain that hyperaesthesia is
kept up & a part by nervous excitation - Thus you see that
inflammation is not of a simple or an exceedingly complicated phenom-
enon, We have not yet made sufficient advances in anat-
omy & physiology of inflammation, & I would not give a prescription
for the already formed, therefore in our treatment we must begin
early by experience - Inflammation is a local vital reaction
from a constitutional cause - They differ in their causes, but
the local reaction being general & the form is the latter
symptomatic, Is there no danger in these matters, but they
are a warning to feel safe - I see nothing further than reaction

A serpentine is - which infers they come with scales - 2^d therefore it is necessary
itself down its rapid flight. In the lower orders of animals the
classification, the skin of the amphibia is covered with respiratory pores, the lungs
of the lower, its complicated character becomes more general
of the frog may be said to have still further - the skin now the respiratory pores
We now come to the consideration of the nervous papillae. Anatomists
very much who they supposed they were in some method when the body is high
Generally say that the nerves have their origin in the brain
& spinal marrow & terminate at the surface: but this seems
to me to be erroneous the growth of the nerves being from the circum-
ference to the center. Ever since I have occupied this chair
I have been accustomed to teach the following doctrine - There
are central organs which take cognizance of impressions
sent up to them, There are superficial organs which receive
these impressions & these are connected by the nerves which
transmit these impressions. We now here find the same
organ performing two offices - it is as probable that the
nerves both receive impressions & transmit them to the
brain. The late investigations go to confirm this view of the sub-
ject. There are seen on the surface of the derm numerous conical
papillae with contiguous bases: but the nerves which pass through
the derm cannot be seen to expand through these papillae: and more-
over the amount of nervous tissue entering the derm is not suf-
ficient to form these papillae. The retina of the eye has lately been
shown to be a compound structure & not a mere expansion of the
Optic nerve. It consists of 1st a layer of globules 2^d minute ramifica-
tions 3^d of club-like elevations. The nervous tissue of the skin

for the purpose that the destruction of the beautiful fabric
of the higher order of animals - The Creator surely has exhibited
nothing without a wise purpose, let us see then what is this
design - My own opinion is that this is salutary, but I do not
recommend me, inflammation produces death, fever produ-
ces another, without the aid of the vital constitution, and the whole
the world be a great & great pool, yet the wind came and upon
the prostitute a tornado sweeping with destructive violence for
the ruin of the world, & with fire - The seem to be some im-
perfect in creation, Certain ^{supernatural} agents enter into the economy & must
be gotten rid of, how is this accomplished? by inflammation
a piece of glass enters the flesh & is thrown out by inflam -
When this is not produced tetanus often takes place - A life
of tension is to be repaired, this is accomplished by inflam., you
are not to compound together inflam. & the plastic necessity
of heat, the virus is the trigger about, place the parts in con-
tact & action inflam. & it is accomplished much more easily,
than by inflam., When ulceration through the intestine is going on
inflam. within the veins or lymphatics enters, the blood is, & presents
effusion into the peritoneum - A resinous agent is applied to
the skin dissection takes place & the agent is left off -
As to the mucous membranes of the intestine if a solution of
is in contact, & an effusion takes place & is washed away

may be considered a papillary membrane. These papillae are arranged in lines formed of two papillae placed side by side. These may be distinctly seen on the ends of the fingers & palms of the hand. Some observers say that they have traced minute nervous filaments into these papillae, but they are not very certain as to the

correctness of their observations. ^{Some have said that he has traced the nervous filaments dipping into the papillae & being in the skin of the frog, always running under the skin, the nervous filaments separate a narrow line with each other forming a net of filaments, & from these he seems to pass into a network - The nerves of the mouth return into their own trunks, those of the skin into other trunks. The frog when}

In the skin of a frog the derm is very minute & is scarcely perceptible. Hence we may conclude that nerves of ordinary sensibility. The skin of this animal at low temperatures performs a highly form processes, strongly marked, meet into a tubular structure the office of respiration. But when the temperature is raised to a certain degree the lungs are brought into play. The arrangement of the nervous tissue is also very delicate -

^{Hydrophorous or} The Sudoriferous apparatus is a separate & distinct glandular arrangement & the duct is a proper secretion & not merely a vaporous exhalation. There is evidence of this in the great quantity which is produced under particular circumstances. It consists of a sac at the base of the derm & a spiral duct leading from it & terminating obliquely at the surface of the cuticle. ^{the nerve from the base of nervous papillae} These ducts whose orifices constitute the pores are at their ^{termination} surface nearly parallel to the surface of the cuticle. The duct is continually escaping from the skin, but is evaporated so soon that it cannot be perceived. It is the spiral form of the duct & its oblique termination which gives the cuticle

Congestion & inflammation of part also prevent absorption
from the part where frictions are applied to a surface -
There can be no difficulty in discerning the design of inflam-
mation, But the deeper seated (so called) inflammation puzzle
us, the exciting causes are here unknown, May not the air
be in the stomach & the water we drink & the food we eat enter the
element of our death? Now is it that epidemics prevail - Is not
the action established & around the delirious agent -
What is it that afflicts the mind in epidemics is it
the action of fever when it should cease? What are our
means of cure? Elimination we admit nature & then release
the system
of the system which may exhaust it, We carry out the
indication of nature here we bleed freely & the great
art of medicine depends upon knowing at what time to use these
means,
Feb 2

Congestion This term has become exceedingly common - What is the
nature of it? I am disposed to think that the term congestion
& engorgement are used without any definite meaning -
It is deemed for engorgement to keep together & unapplied by the old humoral
pathologists to a collection of humours, now to a collection
of blood. No one knows to you that engorgement must take place
in the capillaries; but you hear of venous congestion; the mischief
be the effect of obstruction & loss of vital action, & in some

the appearance of impermeability. That these tubes do conduct the sweat is certain for it can be seen to issue from them.

The muciporous glands are also somewhat different from the sudoriferous, & are each surrounded with a rete of minute vessels. Their ducts are nearly straight & terminate at the outer surface of the derm between the lines of papillae. The sudoriferous ducts ^{these tubes often ramify & anastomose, the sudoriferous do not.} terminate on the ridges. The muciporous glands secrete a mucus forming a layer upon the surface of the derm.

The Chromatogenous globules have been described by ^{above} Broderick & others. Tufts of numerous fine capillaries enter these glands which contain a great number of scales. These scales fall out when the ducts of these glands have a common termination with those of the muciporous glands. These glands have ^{in the mucus is always mingled with colouring matter} numerous ducts terminating on the outer surface of the papilla tactus. They secrete a pigmentation in the form of scales which being united by the mucus form the rete of Malpighi. The scales are exhibited by softening the cuticle in water & breaking it with an instrument under the microscope. These scales are of different forms in the different races, being ^{particular} trapezoidal in the whites & spatulous in the blacks. The root of the scale is colourless but the free edge is striated & coloured according to the race. The derm with its vessels & lymphatics ^{& nervous papillae} is colourless & the cuticle transparent or that it is then scales give the colour to the skin. Also frequently using the term rete led physiologists astray, they supposing

heart produce about the is not what is understood by congestion
Arterial congestion may be produced by obstruction of the capillaries
The blood with great accumulation & the arteries but with
a full bounding stroke, as in effluvia of lead & effluvia of poison
It is worthy to note that we are to look for the least sanguine con-
gestion, what the effect of it, if we find blood collected in any or-
gan cannot for any length of time, the function of that organ
must be altered, it ceases to receive the proper supply of blood the
the organ is at last destroyed, its function being annulled the degree
will vary according to the nature & importance of that organ
If the brain be affected it, you find stupor, coma & the effects of
congestion of an organ are 1st as proportion to the size of the organ
& the amount of congestion & the importance of the function -
Congestion may prove injurious both by abstracting so much
blood from the circulation & by suspending the function -
Congestion is an effort; of what cause? This is the most im-
portant point to determine as upon it depends our treatment,
Then we at once get into a difficulty, As far as we can observe it
is very similar to inflammation - you cannot inflame without
with congestion, but in many instances instead of inflamed congested
is the first step, What determines this congestion? There is what
the older writers termed inflammation & a sudden move-
ment of the blood from the part to the other, I am aware of some

that it must be vascular, whereas it is void of vascularity. The chromato-
genous glands are very vascular & receive the terminations of the
capillaries. It is untrue that we are to look for the colour in inflammation
& congestions. The foregoing is according to Breschet. Huxley in Ber-
lin & others have made important aberrations which differ a little in
some points { ^{in the} Epithelium the epidermis, is of a dark white colour, called
hypometria

The Epithelium which constitutes the external layer of the skin
is composed of cells ^{each} occupied by a nucleus which contains a punctate
form granule. The Epithelium ^{covers} all free surfaces & all
the canals. It is found in the alimentary canal & all the serous
membranes on the exterior of the body. It is divided into 3 kinds
1st Plaster Epithelium, the cells of which are polygonal
& contain a kernel & granules; forms the epidermis, & the lining

membrane of the commencement of the nasal passages, mouth
pharynx, oesophagus, vagina & ^{in the} ^{these cells} ^{are} ^{the} ^{surface} ^{they} ^{become}
pharynx, vagina & ^{more flattened} & at the surface are more dense
2nd Conical Epithelium, the cells of which are conical, exist in
the stomach & run through the alimentary canal. It is covered
with cilia. which are fine hair-like projections & are found in the ventri-
cles of the brain & in mucous membranes generally. They were first disco-
vered in the Infusoria lining their channels & giving motion to
the currents of water which circulate through them, by which
means aspiration is accomplished. They have a motion resem-
bling the waving of wheat. By the motion of the water through

When pain was intense, bilious and cerebral myctus at
onset his face was flushed, at the next moment pale at
the same time that the circulation for supply went on regularly.
Frequently you see congestion of the head relieved by a slight flow of
blood from hemorrhoids. A gentleman applied with the symp-
toms of threatened apoplexy. I bled him 6 bottles before
it. He says he found himself relieved of his cerebral congest-
ion, but felt a singular sensation at the end of the nose. The next
morning he was horrified to find his nose enlarged & black
appearing with the cellular apoplexy had taken place & he was cured
by the caustics - Now we are to account for these changes? I think
that we must go to the nervous system. We see the flush of anger
or excitement, the flush of modesty, the pallor of fear. We
see in the disturbance of the nervous system pain with swelling
& probably the cause is caused by a disturbance of the co-ordinating
The ganglionic system probably controls the circulation
then congestion will be produced, when we set up a gang-
lionic system, then cold. A girl with all these things
by the exercise of running up & down stairs sitting at the window
a short time, she was seized with dyspnoea & oppression of
breast, I was sent for, I found her sitting up her mouth open
unable to take respiration and not being able to lie down
I gave a sin ^{muscle} spasm corrected with the hand & she was cured. I put her

these animals, no intention is carried on & the feces has excretions removed
What office they perform in the brain, now Bromelia &c is not
known but they are found in every order of animals & must ^{be for} have some
specific purpose. The ciliary movements continue long after the
membrane has been removed from the body, indeed until decomposition
commences. ^{In inflammation the scales are thrown off faster than they are}
^{formed hence the covering of the mucous membrane in their place}
^{supplied by mucus to which a few facts succeed p. 10}
Where I see that the epidermis is formed of colouring scales
& mucus. Your view be correct the difference in colour of races
cannot be the effect of the sun. it is attributable to a difference
of organization. The sun may darken the skin in a mucus but it
does not alter its organization. Whites who reside in Africa
do not become black neither do the negroes lose their colour
when brought to northern climates. The colours of all animals
& vegetables seem to be produced by scales. The butterfly's
wing owes its hues to them ~~scales~~ In the Chrysalis state the
^{which mucus is replaced by scales}
Wing is a mucus state & its colour is then regulated. Nature
then may be said to paint in mosaic & not with a brush
The colour probably depends upon the form of the scales, the refraction
of light through them giving rise to the different colours
The colouring of plants probably depends upon the same arrangement
& there is no difference in nature between mucus & p. 10
with great quantity of globules in the latter, the mucus consist-
ing of albuminous matter with a few globules suspended in it

in warm sand, she was relieved & the blood commenced to flow
from the injured vein, there is a case in point -

What is the nature of congestive fever? In some cases I
believe that it is intermittent fever, if so the name of intermittent
should be retained. The importance to preserve the return of the par-
oxysm, I am doubtful whether there is congestion in these cases or not.
I am of gentlemen who was seized with a cold & died within
hours the breath issuing from his lungs being perfectly cold.
On examination after death no congestion was to be detected.
He had laboured under great depression of spirits - Possibly
these cases termed congestive are not so, may not the mischief
in these cases act by destroying the function of the ganglionic
system? This is a point of great importance & we must trust
the gentleman of this rank to settle it.

Pathology of Lymphatic System - 1st Alterations of form
dilatation & thickening, can of course such a lymphatic of course
extremities dilate throughout 2nd Contraction of calibre so
that they appear like narrow cords - 3rd Wounds remain open
case of a gentleman who had a lymphatic function in the leg &
4th Inflammation, this may be of the ordinary kind & arise
from wounds & sores or the presence of morbid matter, the lymph
are tender & suppurate. This is more common in the lymphatic
than in the lymphatic trunks. 5th There is some sense which

Decr. 16th 1839.

The disposition of the rete is different in different parts. At the ends of the fingers it differs from that in other parts of the body. There is an arrangement under the cuticle, another around the sebaceous glands & yet a different one around the muciferous. There is evidence of this in the difference of the secretions from different parts of the body, as from the genitals, axilla &c.

The skin to perform its various functions must be well supplied with bloodvessels; indeed there are so numerous that they nearly conceal the other components of the tissue & almost form an erectile tissue. The condition of the bloodvessels modifies the properties of the skin. They are the cause of the difference between the loose flabby skin of an invalid & the high coloured turgid skin of a healthy man. It is the blood seen through the transparent skin that gives the beautiful red colour to the lips & cheeks. The capillaries terminate in the dermis at its outer surface, ~~but~~^{or} do not permeate it, whereas the lymphatics lie on its outer surface under the cuticle. Tredeinan injected these lymphatics by inserting under the cuticle a tube with a capillary point which entering one of these lymphatics the mercury flowed readily through them. Lowth injected them from the inner surface of the dermis. The lymphatics have no orifices exposed, for the finest injections cannot be made to pass through them.

consider - Lymphatic inflammation as distinct from sanguine
inflammation, the lymphatic vessels being the seat of it & arising from
quiescence & a kind of it is swelling & hardening
but no redness & suppuration never takes place; You may be
deceived by a feeling of fluctuation & plunge your lancet at
the ganglion when nothing but lymph is ^{will escape} raised with blood. If you
make warm application you increase the induration & pain
without bringing about suppuration. I have seen it occupy a
large part of the abdomen, it frequently occurs in neck & may
in any part of the body. It has been stated that carcinoma inflammation
may occur in lymphatic vessels & produce suppuration, the
doctors doubt about this account of size of pus globules -

Scrophulous disease affects lymphatic system. Syphilis affects
lymphatic system, Scrophulous disease has a particular tendency to attack lymphatic
system, probably has its origin in this system; we are not certain that
any morbidness of the lymphatic system & yet there is great probability
of it. The ganglia are not all equally affected in scrophulous -
The bronchial most so, then cervical, mesenteric, inguinal
this is according to Andral, I should think that the mesenteric
more frequently affected than the cervical. Cancer also affects
this system, but is not primary in it, I have not observed any of the

They form a network by anastomosing one with another —

The skin consists of 1st The Derm which is a gelatinous tissue
basis of the skin, in which are glands, ducts, nerves, & blood
& very vascular. 2^d A Papillary Nervous Membrane { Papillae
tactiles } formed of conical papillae with contiguous bases. It is
covered by a kind of neurilemma & the cuticle, the latter bearing the
same relation to this membrane as the dura mater does to
the brain, the former being analogous to the pia mater.

3^d Sudoriferous Glands which have been already described.

4th Sebaceous Glands opening generally into the hair follicles
but in many cases communicating with the sudoriferous
ducts as on the nose & corners of the mouth. 5th Muciferous
or Blennogenous Glands secreting the mucus which forms the cuticle.

6th Chromatogenous Glands ^{the secretion of} which uniting with the mucus
forms the cuticle. 7th The Epidermis or Cuticle. According to
physiologists this is ^{composed} of strata or layers cellular. It is constantly
thrown off from the surface & can be seen in the saliva in the morn-
ing in the form of scales & sometimes globular. 8th Vascular

Capillaries & Nets in the derm & at its exterior surface. 9th Lym-
phatics lying on the exterior surface of the derm & in contact with
the under surface of the cuticle or the nets of Malpighi.

The Functions of the skin are ^{exhalant} four (see next page) viz Excretory or Eliminatory, &
Secretory. Excretion consists in throwing out ^{products} elements already exist-
ing in the blood as the excretion of urine. The glands have little more

Proper function of the skin 1st It is an organ of excretion or elimin-
ation 2^d. an organ of respiration 3^d protection against desiccation
4th. It is the seat of a general absorption

There is exhalation from all animals even of the lowest order &
from vegetables, that from the latter & from insects contains peculiar
principles

Moist & warm atmospheric exerts perspiration, warm &
dry still more

to do than merely strain out the filices already existing in the blood. A secretion however is not to be detected in the blood; but is formed by the secreting membrane for example the Lactum, milk & the Bile is probably formed by the liver from the blood which is submitted to its action - There may also be some Hygrometric, or Electrical functions of the skin: but little is known of them -

Perpiration - The skin is constantly subject to an exhalation from its surface & at all times there is an insensible perspiration given off, which is proved by holding near the skin a cold, polished metallic surface, which condenses the vapour & on a bright day a slight shadow may be seen surrounding the outline of the body, makes it apparent. When the perspiration is produced rapidly it appears on the skin & is then denominated Sweat. The appearance of sensible perspiration depends ^{partly} upon the hygrometric condition of the atmosphere. If it be dry the sensible perspiration cannot be produced without much exertion. If the air be moist the perspiration will be sensible though there be but little exhalation. Sweat is an excretion & not a mere evaporation as is shown by the different quantities produced in different states of the body. The production of sweat is one of the most effectual therapeutic operations & nature often terminates a disease by means of it. The Thomsonian Practice is based upon this. ~~They~~ Gallicans of this practice however use the same means

This was Seguin's method

Sanctus alternate 5 pounds a day, various others, 50 and

30, 40 and

of producing perspiration whatever may be the condition of the body,
whereas different states of the body require different and often
opposite modes of treatment in order to bring it about—
Sweat has been repeatedly subjected to analysis with various
results, which might have expected from its varying condition
of the blood in different states of health, the character of the inges-
ta &c It contains water, carbonic acid & nitrogen, ^{chloride of sodium} magnesia
lactic acid, lactate ^{chloride of ammonium} phosphate & carb of lime & soda & many
other elements. It contains no urea which is a characteristic
element of urine, but its other elements are with this excep-
tion similar to those of urine. When the sweat is not elimi-
nated there will remain in the system, unless taken up by
the urinary excretories, products which are injurious & which
should have been thrown off. The Quantity of animal matter
eliminated depends upon the state of the atmosphere, the
ingesta & the state of health. Dalton ascertained this quantity
by weighing the body at two different times, also the ingesta &
other excretions & attributing any loss not otherwise accounted for
to the perspiration & pulmonary exhalation^x. The amount of the
latter was determined by ~~placing~~ enclosing the man in a gum elastic
bag with a mouth piece, weighing him allowing him to breathe
a certain time & again weighing him. The loss of weight should
be the amount of pulmonary exhalation. According to him the cutaneous

Air saturated with moisture restrains entirely the physical
evaporation, water restrains a effectually the vital -

Water carbonic acid ether odours, also mercury - gold in
the vicinity of a person under saturation will be amalgamated
The heat of a dog kept with phosphorus & ether will burn
me in the dark

exhalation (amounts to $6\frac{3}{4}$ ounces daily of which $\frac{1}{4}$ oz is
cost in) - According to Leguin the loss in a minute is 18 grs
Manometer & 24 hrs 5 pms experiment 10 11 02
of which there is 11 by the skin & 7 by the lungs. The greatest loss
is during active digestion. The least at its commencement
It is influenced by atmospheric pressure. //

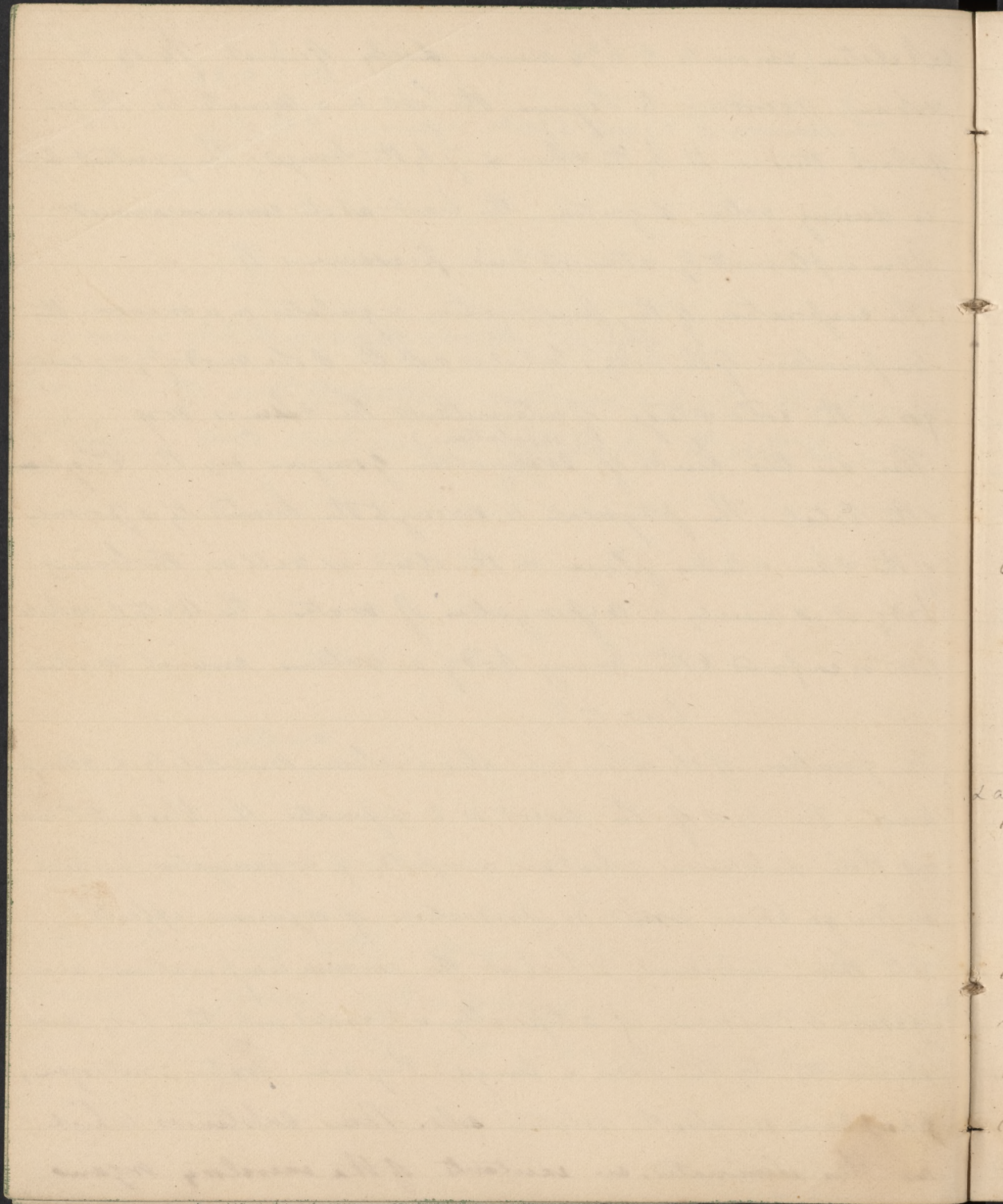
The evaporation of the perspiration regulates in a measure the
temperature of the ~~body~~ ^{skin here the whole of the body in fevers}; but it is not the sole modifying cause
For in the cold stage of intermittents the skin is dry
(exhalation.)

There are two kinds of evaporation going on, the Physical
& the Vital. The physical is owing to the humidity & porosity
of the skin & takes place on the dead as well as the living
body & is merely a vaporization of water. The Vital exhalation
is confined to the living body & contains animal matter

Decr. 17th

The functions of the skin are elimination, ^{sensibility} & absorption.
The object of the sweat is to depurate the blood, to throw
out those substances which are incapable of organization & which
as foreign bodies would be productive of injurious effects.

All those substances which at the common temperatures are
gaseous or vaporous, if artificially introduced into the body, are
eliminated by the skin & lungs: they are water, nitrogen,
phosphorus & also the volatile oils. Those substances which
are thus eliminated, are excretants of the excretory organs



we use them to produce perspiration. I am supposing that mercury is eliminated from the system by the exhalants of the skin & lungs. There is a particular relationship between the different excretory organs, e.g. between the skin & kidneys. In warm weather when perspiration goes on freely there is a very slight secretion of urine, but during cold weather opposed the influence of a fever when the perspiration is diminished or suppressed there is a greater discharge through the urinary organs. There is also antagonism between the mucous membranes & the skin: thus diarrhoea is frequently produced by a suppression of the perspiration. In chronic diarrhoea & dysentery the skin is dry, rough & harsh: this state of the skin being sufficient to indicate these diseases to the physician. In cases of dropsy the perspiration is diminished. The blood requires a certain quantity of water in its composition ^{to exert its movement} for perspiration to take place, a quantity more or less than that comprised within perspiratory range, being sufficient to impede or suppress it. Everyone is aware that in warm weather frequently the simplest of drinking a glass of water will cause a copious perspiration. In Burns which are not very extensive often give rise to internal inflammation: this is not so much owing to sympathy as to the disordered state of the excretory organs & the consequent want of depuration of the

Perforation divides into active & passive - active requires
a certain degree of stimulus

The pulse at the time that a critical point is about to be
reached is full soft & has a peculiar rhythm, three beats
uncertain order & then a repetition - In passive perforation
the skin is cool moist & pallid, shrunken, with
pines an infrequent - circulation is passive - results a
more leakage. The cold sweat of death is of the nature -
it has no unctuous feeling like true sweat - it is also
faint, pale, & it is a sign of advanced phthisis or
as a patient lies down the circulation is reduced in
other places, also in collapsed state of cholera & diphtheria
* I saw a case of a man whose perforation was so
fatal that he perceived his object & he was dead from
every body knew - would he had been admitted, I suppose
to see for the glands around the anus.

Blood. The dangers of exanthematic diseases are partly attributable to the affection of the skin.

The function of perspiration presents some singular varieties: some persons sweat only from the palms of their hands, others from the soles of their feet & others from ^{the armpits & axillae} their axillae - The sweat from particular parts is sometimes very fetid. This is attributable to the sebaceous glands in those parts being affected.

The sweat in these cases contains an oily matter & ammonia which give rise to the odour. When applied to by patients thus affected take care how you treat them for the suppression of this perspiration may be followed by disastrous consequences. Odoorous baths are the only remedy which can be used without danger.

The sweat of a healthy person is slightly acid. When sweating is going on rapidly, the skin becomes tinged with blood & the pulse is peculiar being what is called, a *rethrice* pulse: the first pulsation is weak, the second stronger & the third still stronger than the second. In some cases the sweat besides having a peculiar smell is alsounctuous; this is the case with a sweat terminating an intermittent & other fevers. The passive sweat is very different from that produced by excitation of the skin. The latter is cold clammy & relaxed. This is seen in cases of fainting, and the sensation of depression or terror, in phthisis during sleep, & in Asiatic cholera. Perspiration is suppressed in the cold stages of all fevers also in

x A certain degree of excitement is necessary, if the matter is
to be above or below certain limits prescribed for each place.

x An intestinal epidemic prevailed in Europe called
bloating disease. It continued for a few hours, the
most successful treatment was homoeopathy.

all cases of reaction prostration which are to be followed by a reaction. It probably depends upon the nervous depression. As a general rule nervous prostrations are diseases arrested in their forming stages, in ~~all cases~~ ^{some cases} the skin is dry & cold or in some cases there is a profuse sweat. The plan of treatment in these affections is to promote perspiration. If perspiration can be brought on at the time that a prostration is expected it will generally be prevented from recurring.

Secretions & excretions only take place between certain ranges of temperature: hence in cases of highly inflammatory fever when the skin is very much heated, sweating is produced by cold applications. In cases of nervous prostration stimulants have the same effect. In many diseases the sweat is peculiar. In yellow fever the sweat is acid, an experienced person can detect it as soon as he enters the room. In rheumatic fever the sweat is also acid but differs from that of yellow fever. In typhus & typhoid fever the sweat is fetid. Cases of bloody sweat have been recorded, ^{Chavez & Schubert & Colman} ^{said to have been colored blue in some cases} as a case of yellow sweat, occurring when the patient had taken chubast in large quantities. Sweat itself sometimes constitutes disease. I met with a case of periodical sweats accompanied by chills. There is a case mentioned of a woman who perspired so much as to wet 20 sheets in 25 ^{hours} minutes. A few years ago there was an epidemic in Europe of which a profuse sweat was the principal symptom.

Root functions coloured + mucous secretions - epiderm
hair nails are constantly being worn away & renewed

The Secretions are colouring matter, ^{mucous & epithelial} mucous & sebaceous matter. The ^{epithelial} colouring matter is constantly peeling off & being renewed. The mucous is a secretion and not an excretion as it cannot be detected in the blood, so also is the colouring matter. The mucous glands sometimes produce a vitiated secretion as in Ichthyosis, in which the skin is covered with scales ~~resembling~~ those of fish. Where the name, A gentleman near this city is thus affected, it is hereditary in his family. Sometimes they produce a horney secretion, I saw a sailor who had two horns on his forehead in consequence of a syphilitic affection: they disappeared after a long continued application of caustics. The Chromatogenous glands are sometimes in a morbid condition - Albinos are ^{an} example of this. In their skin the colouring matter is generally arrested in its formation, which is the case with most monstrosities. The Sebaceous glands secrete an oily fluid which keeps the cuticle in a flexible state. They do not always terminate in the hair follicles for they are seen on the glans penis when there is no hair. These glands are sometimes vitiated & secrete an offensive matter: a gentleman applied to me who had been turned away from several boarding houses on account of an affection of this kind. He was very cleanly ^{took} a bath every day, & yet the offensive smell continued. I know no remedy for this affection. This vitiated secretion is generally from

The skin is not the exclusive seat of sensibility, nor is it yet
developed to the highest degree. There is a spinal apparatus
it =

The brain itself has no sensibility what shows that it
is not the seat of the - Sensibility may reach the spinal centre
& not being transmitted to brain without causing sensation
produces spasmodic movements - Sensation is seated in the
brain, sensibility in the peripheral system - I think Mr
Shall Hall's theory of a distinct electro-motory system as well
superfluous. General sensation is for it apparatus the 1st 5th
part of 8th 2 portions of spinal nerves - There are likewise specific
sensibilities - The external apparatus is excited into action 1st by
external physical agents. The same cause so acute that this
excites 2^d vibration pair - 2^d by internal causes 3^d
4th by chemical agents

Every part of skin has apparently a sensibility of its own - Prof
Waller measured the sensibility of different parts of skin - He put two
pieces of cork on the points of compass & applied them to the skin
& to the finger. The sensibility is inversely as the distance at
which two distinct sensations can be perceived - There is a
girl in the Massachusetts asylum - who has lost her hearing - deaf
since & nearly blind, her touch alone remaining perfect -
There is interesting as it shows that the mind can be developed

the glands about the anus. Sometimes from the axillary glands
Nervous Papillary Membrane - Report of the skin is with-
out this. Sensibility is the function of this organ - Sensibility
& Sensation are different. Sensation is complicated with sensibility.
In sensation the brain must take cognizance of the effect pro-
duced upon the organ of sensibility - Sensibility is independent of
the brain as regards its organ & remains after the brain is removed
^{or when its functions have been suspended}
The impressions produced upon the organ of sensibility is conveyed
to the brain by the nerves & consciousness is then cognisant of it -
If the impression produced be conveyed to a nervous
centre which communicates with a muscle the latter will
be excited & contract without the intervention of the brain -
This organ is no more an expansion of the nerves than
the rete is an expansion of the aorta - In the lower animals
there is only sensibility without consciousness. They have no
nerves & this whole structure possesses sensibility. This organ
is independent of the brain & nerves & has its own phenomena connec-
ted with it. It is an element of the function of sensation -
Sensibility is divided into general & specific. The latter exists at the
end of the fingers - It differs however in different parts of the body,
each part having its particular sensibility & this is another evidence
that it does not proceed from the brain. The pain produced in each
distinct part of the body is peculiar to it -

A gentleman from Maryland applied to me with a severe
pain confined to a zone passing round the body, about the height
of the xiphoid cartilage. There were no symptoms of inflammation
it was frequently relieved but returned again & at last the patient
~~was~~ succumbed to it —

Through the means of imprints received by me some alone —
He knows when a door is open by the vibration — if he takes a paper
by the hand, since he recollects how after it — Her name is Lydia
Bridgman — A young lady in Louisville had her sensibility reduced
on one side of the body, the other became exceedingly acute — Great dif-
ficulty was found in communicating with her until a lady took
the plan of writing to her chest with her fingers — After this the
improvement — just as any one could write on her hand — The blind
can distinguish colours, there is a horse-jockey in the city who
always depends of night and into the colour of a horse — In
some persons the sense of touch is dull — & it is probably in this sense
that some persons are so much more expert in delicate operations
than others — When sensibility is absent in the hand, the individual
can grasp any thing so long as he sees it, but in the dark he drops it
When sensibility of feet is impaired the person cannot walk in the dark —
& I himself is an instance of this — Sensibility is sometimes so much

Sensibility may be augmented, diminished, perverted or destroyed. Augmented sensibility without inflammation constitutes neuralgia, it is ~~un~~^{not} accompanied by dwelling or a change in the appearance of the skin - When it is perverted when itching is produced. This occurs in some cases at particular times, sometimes only during the winter, sometimes at night & so on. In these cases there are generally minute elevations on the skin visible with the microscope - Sometimes sensibility is destroyed in particular parts of the body. It is confined frequently to a few square inches

Decr 19th 1839

Absorption - The animal economy derives its support from external matter introduced into the system by the process of absorption. This was ~~once~~ supposed to be performed by the veins after the discovery of the lacteals absorption was attributed solely to them. Majendie first called the accuracy of this over into question. & made many experiments on the subject which it is useless to detail, It is now regarded as a property of all organic tissues - There are ^{two} species of absorption, one is simple imbibition, a kind of capillary attraction which is merely a physical process & common to organic & inorganic matter - The other species is exhibited principally in organic tissues. It is scarcely possible that fluids ^{by simple imbibition} should flow through vessels

represented that the contact of clothes cannot be born - This is often
confined to a small space - sometimes to a mere zone - Position is
important, which give rise to hallucinations or false perception
probably seated in brain - The brain of brain whence the seat of sensation
produces hallucinations of all the senses - touch - sight - hearing -
The great Reformer Luther had a hallucination of touch & sight
& thought that he touched & saw the devil & had constant con-
versations with him - I saw a case of persons last winter, who were thrown
into convulsions by the application of any thing either colder or hotter
than the hand, & the action of surface - It is good illustration of the
reflex action of the nerves.

for a membrane not more than $\frac{1}{10000}$ of an inch in thickness
The property ^{up} by which this absorption takes place is termed
endosmosis. This is illustrated by placing in a vessel of water
a piece of intestine or other membrane containing a small quan-
tity of mucilaginous fluid. The water will flow into the membrane
if a tube be inserted into it the water will rise in the tube to
a considerable height. If the membrane containing ^{water} mucilage
be placed in mucilage the water will flow out: this is termed
exosmosis. The circulation of plants is probably effected through
endosmosis. The opinion is general with regard to internal absorption.
But there has been much doubt about cutaneous absorption.
Léveillé from his experiments concluded that there was no such
thing - but his experiments are liable to great objections. Some
students of this school took up the subject, experimented on it
& wrote a thesis which seemed ^{in part} to sustain the views of Léveillé.
They found that turpentine & some other odorous liquids were
absorbed rapidly by the membranes of the lungs but not by the
skin. ^{on absorption by the skin is done by lungs - but not by the skin} D'Almeida of Amherst has shown however that, though
turpentine & some of the oils are not absorbed by the skin, ^{yet} other
fluids are, particularly on the inner side of the thighs & arms.
Though the cuticle is an impediment to absorption it is not a
complete barrier. It may be made more permeable by chemical
& mechanical means. Baths soften the cuticle & cause it to swell

x When charcoal was applied to the skin of plants it gave no indication of
being absorbed, but when both were used it was detected in the urine
& I think it settled that altho' the skin covered with the opium
was is not capable of very active absorption, but still this function
exists to a certain degree -

Reflected - then brought into contact with the surface of various vessels -
& in this way promote absorption. Bath. impregnates with iodine
& many other substances make an impression on the system, being
about the active ingredients being absorbed into the body -

Friction promotes absorption, & ~~the~~ has shown that many
substances may be made to enter the system by being
rubbed on the skin. When the epidermis is removed absorp-
tion goes on very readily. Under the cuticle are layers of lym-
phatics which absorb rapidly substances applied to them. Medicines
are often exhibited by applying them to the skin after the remo-
val of the cuticle. This is termed the endemic method. *Painia*
stropharia & *brucia* produce their effects on the system as readily
when applied to the skin as when introduced into the stomach
After they have been applied for some time they produce inflammation of the skin.
This method is very advantageous when the stomach is not in
absorption ceases - Very irritating substances rarely produce constitutional effects
a state to receive them medicines - The skin is sometimes softened
when the applied -
by previous friction & the application of medicines - I once saw a
lind; salivated by the application of mercurial ointment to the
eye for about two days & a half; this certainly could not have a
case of absorption by the lungs -

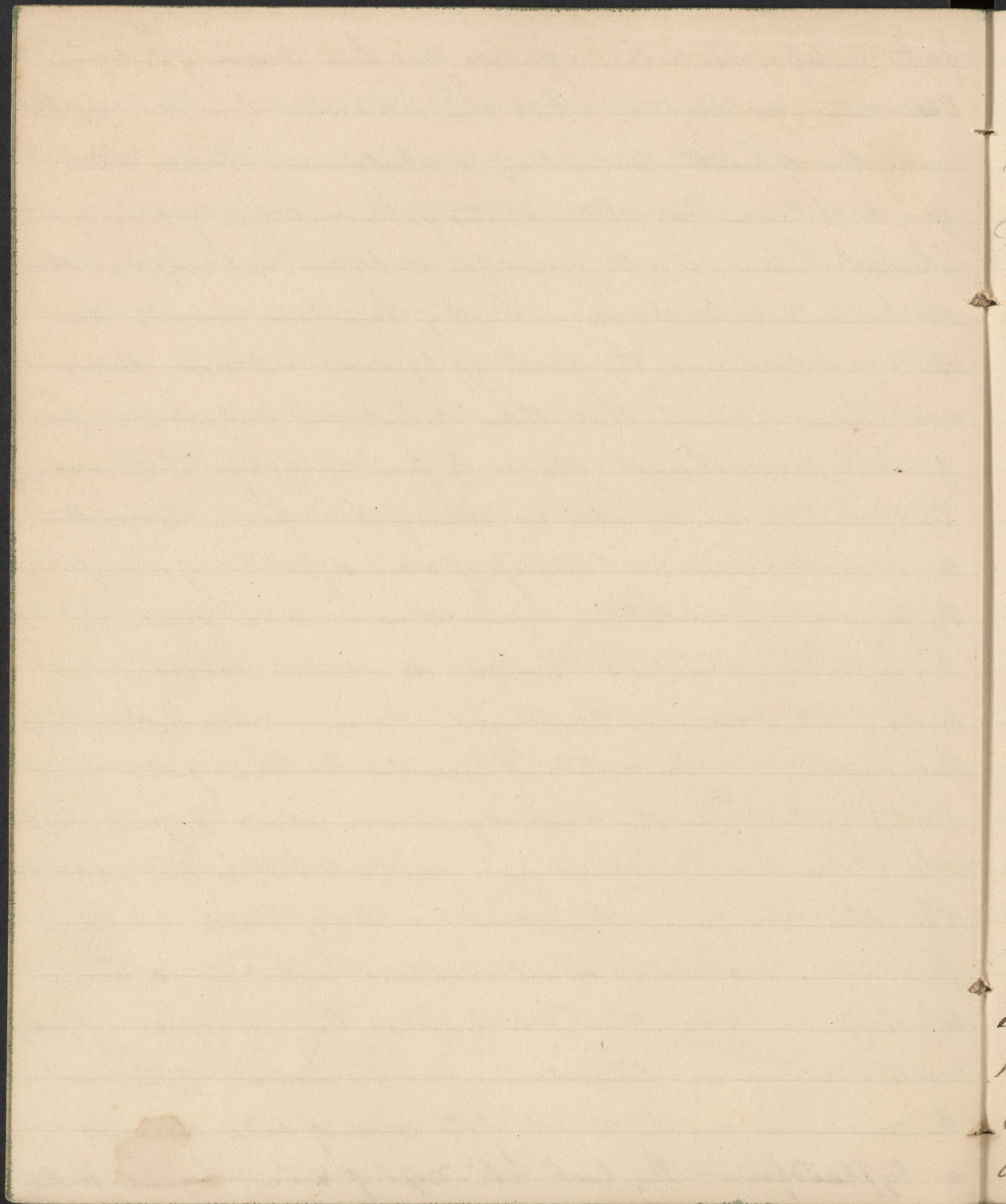
The Pathological Relations of the skin are exceedingly
complicated & numerous. Most specific diseases of the skin
assume a specific character, why they do so, has been a perplexing
question to physiologists. The forms which cutaneous diseases
take on present certain analogies & distinctions, by which they

x We have many reasons for supposing that the external forms
of cutaneous diseases depend upon the composition of the skin
& the peculiar part of it affected & act upon the internal disease.
Diseases of the skin may be divided into 1st Idiopathic
2^d Accidental or symptomatic 3^d Those connected with
the course of internal affections — as in the case of scurvy it
has been entirely ascertained that scurvy rubbed up with lead sepi-
on surface or time of eruption of variola, causes this to abort when
the patient is removed the skin appears to have been severely affected — It
seems to produce little or no effect on the constitutional affection
Diseases very different in their general action produce similar effect
on the skin

may be classified.* The outer forms of these diseases are often
governed by febrile symptoms upon which they seem to depend:
but the same external appearances occur without any febrile
symptoms. Some diseases present many ^{external} forms. In syphilis
there is nearly every form of external symptoms as rashes, ex-
coriations, ulcers, pustules &c. Scrofula also presents many
external forms. There is another circumstance which leads us
to ^{infer} suppose that the specific form of the cutaneous affection depends
upon the composition of the skin & not upon the peculiar character
of the internal disease, viz that we can produce by external
applications the same forms of cutaneous affection which are
caused by internal diseases. In studying the diseases of the skin
we must carry our observation farther than the mere skin. The form
of the disease depends upon the anatomical element affected, which
depends upon the nature of the internal disorder, in some cases upon
the state of the blood. In the same affections of the viscera different
external forms of disease are produced in different persons, so that
we cannot determine the character of the disease from the appearance
of the eruption. Pustules are often relieved by an eruption on the
skin, the disease being transferred to it from the internal organs
nature in this manner effecting a cure. The place of treatment pointed
out by nature is often followed by physicians; pustules are produced
by application of antimony, vesicles by blisters &c. or ^{a cutaneous disease being} thus established

Rashes or exanthemata do not run into one another but continue distinct throughout their course. Altho the vesicular note is the mark of affection in all of them, yet they have each peculiar characters. Every disease is distinct in its external expression. Probably at the same time the mucous membranes are similarly affected. There cannot be sygnificance of course but the different forms greater may exist. Now for the cutaneous affections affect the termination of the disease & I think that the quantity of the eruption in scarlatina is not an indication for favourable termination. We are afraid of suppurating & hence we make use of cold sponging when the skin is very hot. Small pox alluded to yesterday - the effect of the skin probably is the cause of many of the bad secondary symptoms. It was found among the Arabs that mercurial treatment controlled very much the eruption of small pox - Absolutely attracted notice in Europe - The whole of their observation is that the calomel arrests the eruption - & when the former is removed the skin is found white - Is this a safe practice? The experience drawn from 150 to 2000 cases is in favour of it - You can not however seduce the patient by this means, as he will often die of the same symptoms as in confluent small pox - The treatment seems to lessen the mortality & to prevent the deformity - I have tried it in one case only, have pleased with the effect yet though the case itself was an unpromising one -

for the relief of an internal affection. And here I warn you to respect
these cutaneous eruptions which are ^{often} established by nature for the
preservation of health, particularly in children - Nurses often
give to children good little doses for the subtraction of their system
which is thrown off in the form of an eruption. Such eruptions should
not be meddled with, for when they have been removed the
child is not infrequently carried off by some internal disorder,
and I have observed that those which are subject to eruptions
generally pass through the early periods of life without danger.
The following are the skin eruptions of the skin - Exanthema-
ta or rashes - uniform redness of skin or patches of redness
they terminate by resolution, desquamation or (deliquescent?)
^{erythema, scarlatina &} They occur in measles - Bulla - is a vesicle containing a
serous fluid it occurs in Pemphegus - ^{& suppurative} I saw a lad with whom
this eruption was congenital. If he rubbed his head with sand
a bulla would appear the next day. He was about 8 years of age
when I saw him & it had existed from birth. If the force applied
to the skin was greater than ordinary a bloody bulla would
be produced. ³ Vesicles are small elevations containing a drop
of serum & sometimes a little pus. they disappear by forming
crusts & sometimes by deliquescence - ^{or very minute vesicles; they} Scudamina appear at
the commencement or in the middle of the course of some diseases
as typhoid fever they look like drops of sweat beneath the



skin & are covered by a thin cuticle. They are not however peculiar to typhoid fever. I saw them in a case of tubercular arachnitis - Pustules contain purulent matter.

Dec. 23^d 1839

Regulation

The character of the eruption does not always indicate the nature of the disease which causes it: but there is a connection between them e.g. Some diseases produce a certain eruption which always attends them: while there are other diseases not analogous to them, which produce the same eruption. There are particular diseases affecting the sebaceous glands; & these affect the palms of the hands & soles of the feet, not containing such glands retain their natural condition. There are ^{some} many eruptions whose appearance indicates the nature of the internal disease. Scarlatina is characterized by exanthematous ^{eruptions} small-pox by pustules & eruptions. Shall we in the treatment of these diseases allow them to run their course or shall we adopt measures calculated to diminish it or cause it to disappear? There is at present much doubt on this point. In erysipelas we endeavour to remove the cutaneous affection & believe that the disease is not aggravated by this treatment. In scarlatina cold applications are made to the rash & the other symptoms do not contraindicate them. Researches are now being

Urticaria sometimes red sometimes white in latter case rendered red
by friction - We can produce urtications by the puncture means the sub-
juncts in this effect

made with regard to the treatment of the eruption of small-pox. Dr. Garfield has made many experiments on this point & he has found, that by making mercurial applications to the skin, as soon as the eruption appears & the character of the disease is certain, an abortion, ^{vesicles} as produced, & indurated ina only appear instead of pustules. The disease so far from being aggravated by this treatment was apparently mitigated. The disease, in the cases recorded, about 40, ran its course mildly. The application which he made was calomel made into an ointment & spread on the skin.

The eruptions which depend upon one or two elements of the skin are definite. There are 8 ^{classes} & nine of this character.

1st Exanthems - consisting of - a general redness as in scarlatina, a local redness - erysipelas, or spotted - roseola & measles: and sometimes they present military grains - ^{they appear to be seated in the rete of the skin}

Though they belong to one class they differ. In these there is no alteration of the structure of the skin, no modified secretion from the glands & the skin when pressed with the finger assumes its natural colour. In scarlatina the surface of the skin is smooth & the rete seems to be filled with blood. In erysipelas there is an elevation of the skin of $\frac{1}{16}$, $\frac{1}{8}$ or $\frac{1}{4}$ of an inch. The whole skin appears to be affected & not the mere surface as in scarlatina. The capillaries are affected as in exanthems & to

The prodrome begins insidiously when we apply vesicantia

Will it not be a modified secretion of the muciparous glands?

It is singular that in herpes zoster also the pain is intense there is
no constitutional excitement. The disease seems too to be a constitutional
one, the eruption comes out & runs its course of 8 or 10 days in spite of you

The pus in small pox is seated beneath the cuticle - The surrounding in-
flammation is exceedingly limited - The prodrome is specific & not generic -

Lyceria probably seated in sebaceous follicles of sunken parts, back
& face - Favus seated in sebaceous follicles of hair - It is charac-
terized by a deposit of matter around - There is always a
hair in the centre

generally sometimes bullae are formed —

2^d - Bulla - It occurs in Pemphigus & Rupia but is somewhat different in the two diseases; in pemphigus it is flat & incrusted, in Rupia it is rounded & resembles a vesicle. It seems to consist of a secretion of albuminous fluid which raises the cuticle - Rupia ulcerates more deeply than pemphigus which scabs over
analogous to bullae but smaller

3^d - Vesicles - Small elevations caused by the effusion of serum under the cuticle; occur in some kinds of herpes & scabiness. In the ~~herpes zoster~~ ^{herpes zoster} latter affection they cause a severe pain: but are not attended by fever. Ladamina are small vesicles clear & limpid of the size of ~~peas~~ ^{peas} - a head of a pin.

4th - Pustules - These contain, usually, pus from their commencement, but sometimes contain only serum at first, as in Varicella & Vaccinia. They are seated deeper than vesicles, extending into the derm. In some cases the deep seated glands are affected & thus the more superficial portions of the derm. In varicella if the cuticle be raised the pus will be separated with it & the derm will be found to be covered with red spots. The part in which the pus is formed is not determined - In Impetigo small hard pustules appear which afterwards form large scabs. Ecthema is a hard pustule followed by a scab & ulceration. Favus resembles a honey comb, from which it derives its name. In these different diseases the parts affected differ - The pus-

Pustule maybe produced by testarized antennae - central
& insulating morphia -

tules of variola & vaccinia are superficial, & neither the sebaceous
multiform nor sudoriferous glands are affected. Herpes is an
affection of the sebaceous glands: on the scalp where these glands
terminate in the hair follicles there is always a hair in the
middle of the pustule. Pustules may exist in the skin itself
or in any of its glands. So long as the cuticle remains whole
they retain their pustular character: but when this breaks
scabs are formed.

5th Papulae - Small elevations hard & firm, which pro-
duce itching. They occur in ^{the} stryphulus a disease affecting the
~~surface~~^{skin} of children - Luber uterinus attacks grown persons
& produces so much itching, that it is almost impossible
to refrain from scratching oneself. Psoriasis is very distressing
particularly when it affects the pudenda of females. The
itching in this case is so great that the patient cannot sleep
& produces indigestion & emaciation. Have seen cases which
lasted more than a year although every remedy was tried. When
examined the parts ^{appear} to be natural, but upon a closer
inspection very small papulae may be perceived. What parts
is affected? May it not be the nervous papillae. The nature
of the affection which is an altered sensibility seems to
authorize this explanation.

6th Squamae - Scales - The cuticle is the part affected. At

Ecthyosis is characterized as primarily seated in the muciferae glands, which secrete a moist mucus, hence the irritation of the surface.

⁸ The Chromatogenes glands are also affected & their secretion arrested or modified as shown in one of the diagrams affecting Lepros vulgaris. It is exceedingly tubercular appearing every where or in every colorless usually found in forms which have a delicate skin naturally - 7. The deep
belong ptyriasis, psoriasis -

⁹ Tubercles of skin - commence in skin & grow to a large size, producing great deformity - commences as a small elevation & at the end of years ulcerate & suppurate (Elevation of freckles) Scars, known in the country common in S. America - Some are of the form where whole skin are covered with these tubercles in a commencing state - No need to trace to the skin for the purpose - This is a common complaint in the end -

¹⁰ Lupus another of the same character - tubercular in its character producing ulceration & exceedingly difficult to cure - occasionally cured -

¹¹ Boils or Furunculi belong to the cellular tissue which is under the skin & escape through the skin & ulcerate - Some are from heat or injury - Indurated pustule

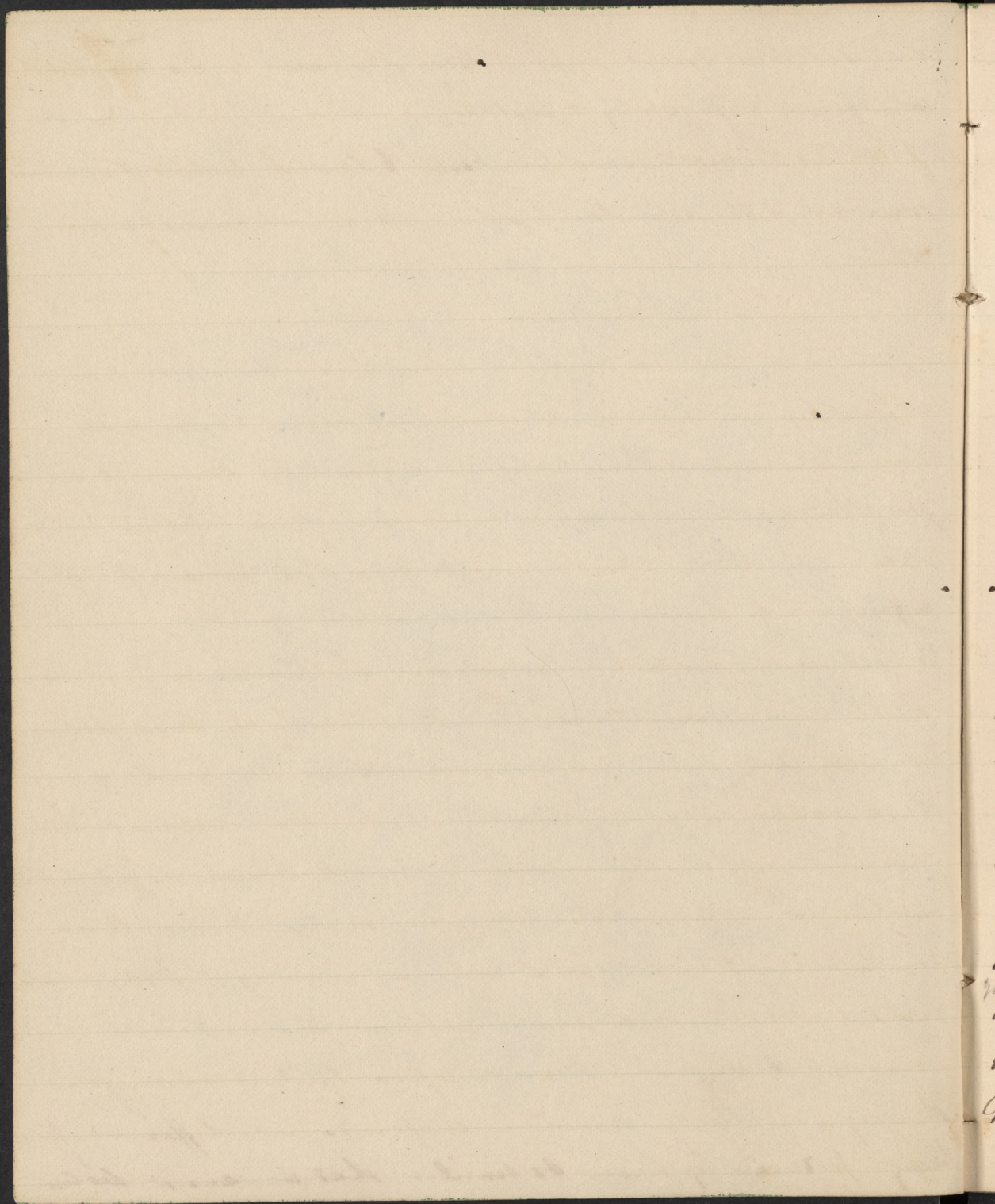
First scales are formed which drop off & leave a red mark, the same process is frequently repeated.

boils

7. Hard tumors, such as ~~boils~~ ^{boils} or fununculi which commence in the cellular tissue & induce inflammation of the skin

Dec. 24th.

Specific diseases of the skin. Are ^{all} then the effect of one action? is a question which has perplexed physiologists - Roget attributes them to inflammation. The same act will produce various phenomena according to the elements acted upon: but this I think is not sufficient to account for the difference of diversities which occur. We must suppose that the act of inflammation is not always the same. The states of the skin as in Scarlatina, Rubrota & erysipelas are very different; are there then different kinds of inflammation? They are frequently spoken of as distinct & the probability is that they are so. We do not know what inflammation is: many of its phenomena are known to us, it is true; but its essential character is yet to be revealed. Until we do know its minute actions it is impossible for us to understand the disease as presented to us in nature. The very simplicity of nature confounds us, different effects being produced by means so similar that we cannot detect

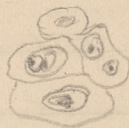


draw a distinction between them. The more dispaetion gives
cells in an arborescent or reticular form is different to
produce the most diversified effects. Until all the phenome-
na connected with the functions of the various organs are
known, we may look upon pathology as a romance & we
are not to consider medicine as a science already ^{completed,} known
but as one that is scarcely developed

The skin is, ^{moreover,} subject to common inflammation which
may arise from various causes. Heat will produce bulla,
erythema, erysipelas or gangrene, Cold will produce
nearly the same effects, which may also ^{follow} be caused by
many other causes,

Malignant pustule is a disease of the skin which is
common in this country. It is not noticed by the English writ-
ters. In Louisiana many persons have been destroyed by
it. It could not in these cases be attributed to the wounds
received in dissecting animals as has been done in Europe.

It appears in the form of a pimple surrounded with an
areola & is attended with intense burning like that pro-
duced by a coal of fire. The only treatment which has
been found effectual is caustic ^{only and of vegetable causes} applied to the part -
Pustules produce mortification. Carbuncle is a disease
of the skin sometimes followed by mortification

Cancer affects the skin as well as other tissues - It is of several varieties - It seems to start from a germinative vesicle - developed by production of vesicles - One consists of a large vesicle & a smaller one - a germinative point which develops itself into a vesicle & produces them, There is the difference between cancer cells & normal products that it is not limited by vital force, it not confined to any type Epithelium or cartilage cancer - is of the structure which exists in the skeleton of the patient yielding chondroma  These are analysed normal products & the capsule which is not limited or limited not development; the life - Cancer is capable of being produced in any tissue whatever.

Nervous affection of sensitive skin

Vices of conformation acquired or congenital - Ichthyosis affects epidermis is always congenital - Horny production - Chlorasia affects coloring matter of a yellow color - Albinism Colour is also modified by nitrate of silver, acquiring a slate colour - I have known 6 or 7 cases in this country of permanent discoloration -

Stems Molluscum congenital affection - common around nostrils - - Stems malum capillus, anastomosis

Syphilis attacks all parts of the body & is accompanied by every form of cutaneous affection. It first appears as a cutaneous eruption. Scrofula is accompanied by many forms of disease of the skin as tumours, Squamous &c. The skin is subject to hemorrhages, producing petechiae & vitices which seem to depend on the state of the blood. Purpura affects the muscles, brain & every other organ. It is an exudation of blood from the vessels into the neighboring structure, It is ^{not} owing to an incoagulable state of the blood, for in two cases terminating fatally I found it to coagulate. The sensibility of the skin may be increased or diminished. This modification sometimes extends over the whole body, at other times it is confined to particular parts. I had a patient in the Alms House, one half of whose body was extremely sensitive, the other half being affected in an opposite manner.

Modifications of the structure of the skin are sometimes congenital, sometimes occur subsequently to birth - The Derm in some cases is hypertrophied, as in cancrinoides, in others atrophied. The vascular system becomes hypertrophied giving rise to aneurism by anastomosis. Affections of the cuticle are sometimes congenital, e.g. Ichthyosis which is generally hereditary: there are families in Europe who have been

According to the development of any an element of the cellular
tissues we have ^{comparing with other} nervous vascular tissue - & the mucous they
are all developed - All membranes forming canals & lining cavities
communicating with the exterior are mucous - All of a pink color
containing a great deal of fluid - are elastic & vascular, they are adapted
with ability to an elevated degree - The mucous membrane constitutes
the organs by which are accomplished the great functions of digestion
respiration &c. - They have many functions in common with the epidermis
functions which distinguish them - It closely resembles the with the
Mucous Mem consist of 1st Epithelium 2nd Layer of granular
plate matter 3rd A dense close rete of vessels & nerves 4th
A dense stratum corneum & dense of skin called granular
the the submucous cellular tissue - The mucous membrane is of a
pink cellular tissue, it must however be considered the dense
of the mucous membrane

thus affected for several generations. The colouring matter is sometimes modified as in Nigrities - blackness occurring in Europeans - Lalande mentions the case of a lady whose face & hands became black in the latter stages of pregnancy presenting a black face on a white neck? & afterwards recovered their natural colour after a profuse sweat which was coloured.

Mucous membranes

These possess all the elements of the cellular tissue viz (the plastic matter,) lymphatics, sanguine capillaries, & nerve tubules developed in the highest degree. It is the most complete variety of this tissue. The body has been compared to a hollow cylinder, the outer surface of which is covered by the skin, the inner by mucous membrane. ^{& between the two persons ~~muscular~~ muscular system} The mucous membrane has been considered by some as a mere modification of the skin, ^{The following facts are in favour of this opinion} Thus, ^{at the mouth &} ^{there is} a gradual transition from one to the other. The vessels ^{then belonging to the one} pass from one to the other & can be readily injected from the other. Mucous membranes, when exposed to the air, ^{for some time} as in cases of prolapsus ani, resemble skin: the latter also when protected from the influence of the air as a measure assumes the appearance of mucous membrane, as exemplified by the folds of the skin of fat children. The mucous membranes

1st Alimentary extending from mouth to anus - but divided
into (a) buccal & oesophageal ending to cardiac orifice
(b) Gastric mucous mem^t, peculiar in its structure & having its own
function (c) Pylorus or intestinal portion ending for pyloric
orifice & colon (d) fecal mucous mem^t of large intestine
There is a difference of function in all these parts & of necessity a differ-
ent arrangement of the structure

- 2 Respiratory (a) Nasal (b) Laryngeal (c) Tracheal
(d) Bronchial (e) Pulmonary
(or secondary) ending at the mucous parts of all glands of the respiratory
3 Glandular & hepatic, solar, urinary - constant
4 Uterine genital & female & male & female & in different parts
5th Mammary mucous mem^t constituting the mammary duct

Alimentary

Epithelium of oesophagus & mouth is apparent & strong - this of
the former can only be detected with difficulty - it consists of small cells
composed of small mucous cells developed & at the anterior flattened
It can be pierced a knife, as the knife passes into mucous membrane the form
changes - Epithelium can be scraped off

Feb, 22

Mucous membrane sustains the organ of vegetable life, all the
portion of which are carried on through the T. crassus & p. p.
The mucous membrane must be injured as the food is taken & happens
as the food is taken, parts remaining healthy for a course of disease

of the various organ parts differ from each other. It may be reduced to four classes or divisions viz 1st Mucous membranes of the digestive organs. 2^d ^{then} of the pulmonary organs 3^d Those of the urogenital organs & 4th Those of the lactiferous ducts & mammary glands. The mucous membrane constitutes essentially the digestive apparatus, the other parts being merely accessory - Various functions are appropriated to the different mucous membranes as the digestion, respiration &c.

The differences in these membranes are not the consequence of any variety in their elements, but arise from a difference in the arrangement of these elements. Mucous membranes consist of 4 layers 1st Epithelium (very delicate) 2^d Plastic layer 3^d Below it of vessels & lymphatics 4th A cellular substratum containing the blood vessels which supply the other strata & corresponding with the above the mucous membranes of the digestive organs vary in different parts. There is an arrangement for the stomach, another for the large, & a third for the small intestines, those of the other organs also vary - We find the slightest modifications of this tissue sufficient to produce very diversified results.

to Nausea & vomiting & the most of being opened this food -
Quillen is probably playing evidence of the stomach -
Alimentary masses mucus - buccal & oesophageal - enteric
from mouth to cardiac orifice of stomach - the epithelium of
the plantar kind - every visible surface - Burns & the naked eye
shows no vessels - is destitute of villi - The office of these structures
is deglutition what they require a canal, probably a thick
epithelium & lubricated with mucus - The alimentary tubes & drinks
pass through the rest of the stomach, it is either an active function in
mucus & the stomach is in a constant state of motion - The oesophagus
is a muscular organ, it is not a canal - The stomachic function
is determined - Old persons inflammation of the membrane - oesophagus
in & pharyngitis - attended with discharge of mucus & epistaxis
which, when the inflammation is continued for some time there is a different
discharge of a tough character & subsequently, purulent - The patient
being the undigested mass - which renders deglutition impossible -
I have seen two cases of death from this cause - one by a man who had
drunk a solution of potash - the other a man from St. Catherine
who after the want of epithelium opens take place at the entrance
of the stomach - Which now turned brownish red, is a pharyngitis
(^{always or} ~~always~~ tracheitis) The way of treating this is to apply
application with a large sound's hair pencil - I have
sent some along to your patients & I should not

Jan 2^d 1840

The mucous membrane of the alimentary canal executes the functions of digestion. It is subject to frequent alteration & the its morbid changes present the most common forms of disease. The Mucous membranes are but little understood but a set of minute operations is now going on with regard to it. Dr. Horner just hit upon the proper mode of examining these membranes. It is necessary to inject the vessels of the membrane in order to study its minute structure. The plexus of vessels when not injected resembles an assemblage of fibres & has been described as a nervous coat. but it has been shown by a fine injection to consist of numerous minute vessels. The submucous plexus cannot properly be considered as forming a part of the mucous membrane, although it is necessary for the functions of this membrane & exists wherever it is found. In every mucous membrane the plexus has a peculiar arrangement. The M. Membr: of the nose has its plexus arranged ~~in~~ in zones, each zone having a distinct disposition of its vessels. In one of these zones are placed the follicles which secrete the peculiar mucus of the nose. Guiliot asserts that from the lips to the pyloric orifice of the stomach the plexus is most easily injected from the arteries: it can be injected from the veins but with difficulty;

well and one year - they all eventually recover if properly treated -
Diaphragm of pharynx also affected in bands, degeneration
Stomach - by no means uncommon must be treated as other structures
Ulcerated Stomach occurs if food is given freely of digestion -
Stomach - The epithelium of oesophagus partly comes to cardiac
part of stomach in Man & the hog - in the horse the whole is
covered - in the grass-eating animals you find a sort of stomach
divided into two - for mastication covered with ^{thick} epithelium
the other not thus covered - for a stomach the food cannot digest
In the ruminant the stomach is divided into three all covered
with the epithelium, for mastication - The further the
time digesting stomach it is not thus covered - In the cetacean
the stomach is complex & divided - 2 main parts - 2nd digest
Stomach - In the digestive stomach the epithelium is of a different
kind - a high microscopic power is necessary to detect it -
x They exist throughout the alimentary canal
Mucous says that its epithelium is cylindrical & 7 rows
says that it is similar to that of epidermis - ^{1/300} inch the mucous coat
generally it must be like for a very recent stomach the
mucous must be removed off - when laid bare it presents numerous
convoluted interstices and small openings (Bischoff -
A successful operation shows large vessels ^{arteries} entering & supplying
etc. - A vertical section shows it to consist of layers of

Whence it appears to be arterial. The plexus of the remainder
of the intestine can be most readily injected from the veins,
which shows it to be venous. This may have some connection
with the functions of the parts. To this may be attributed the fre-
quency of venous diseases in the intestines & the advantage
resulting from the application of leeches to the intestine and
the mucous membrane is the essential part of the intestine.
It differs in the different portions, being smooth in the stomach
& colon & free from villi: but from villi from the pyloric
orifice throughout the small intestines. In the membranes
of the stomach & large intestine are found cryptae, which
are little cup like cavities very vascular. They present the
simplest form of mucous glands. This arborescent structure
is not confined to the stomach & large intestine: it is only con-
spicuous in them because they are free from villi. These
cryptae exist also in the small intestine: but are on the
costs of the villi, by which they are concealed. In cholera
the villi slough away & the membrane of the small intestine
then resembles that of the stomach - The villi are small eleva-
tions lining the mucous membrane from the pyloric orifice to
the ileo-caecal valve & are found nowhere else. They
are small cylindrical, conical, or club shaped projec-
tions. Some are straight & elongated, others flattened

700) of tubules connected at the blood extremity & opening
into the anus - they are closely packed together & secrete a
fluid. The true stomachs of all animals present the array
much, ~~even~~ down to the water insect while the insect stomach
In bird it is more complicated - between the gizzard &
crop is the proventriculus or true stomach. Very numerous
follicles each follicle being a stuff a stomach with three
small tubules opening into it - In the minute structure of
the stomach we see a glandular arrangement, or that the true
view of the stomach is that it is a hollow membranous gland.
This is the true glandular structure - The acinus of the liver
is nothing more than the termination of the ^{small} bile canaliculi - They
all differ a bit packed together in a solid organ -
The stomach is a bag - its essential constituent is the gastric
mucous membrane, its muscular structure seems to keep it
contracted in the food - in a state of disease this muscular power
of the stomach is destroyed by flaccidity & the stomach does not
draw but only holds the food from the source of the emulsion which
can dyspepsia by paralyzing the stomach - The function of the
stomach is chymification - (Lecture of Jan 9th 1840)

When injected they are seen to be continuous with their surface & covered with the thinnest possible (dermis) epithelium. Berries represents them to be exceedingly vascular. & Horner differs with him on this point. Berries has probably had better opportunities of observation & is probably right. According to him they have a large central vein & this surface is covered with a fine net. The blood in them is neither decidedly venous nor arterial, but seems to be undergoing the change from the latter to the former. The vessels of the one can be felt to join another. They appear to be united by cell-plastic & covered with an epithelium. Queller asserts that what are called the glands of Brunner are not glands, and only appear in certain pathological conditions being formed by the union of several villi. He says that an injection separates the villi & the supposed glands disappear.

Jan 6th 1840

Villi when examined after ^{being} have their lymphatics filled with chyle: there is also within them ^{villus} a small cavity which contains the same fluid. From this it seems ^{that} they perform smoothening in chylification. Chylify the villi exist in the higher orders of mammalia, some species of birds & a few fishes. Chylification however takes place in those animals which want the villi: hence they are not essential to the process. This rather embarrasses us in the study of their function.

The Salivary glands differ from Parotid in being circular, the latter being solid & prod of granules

However in those animals which are without villi, the mucous membrane contains many folds. The lacteals ~~originate~~ in the villi & cover them with a fine net. They communicate with the villous cavities of the villi. As they do not exist in all animals there is some as to their being the excretory absorbent of the lacteal fluid - They have no external opening as was formerly supposed, the surface being continuous -

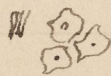
The glands of the muc. mem. are of three kinds viz Brunner's glands, glandula solitaria & the glands of Peyer. Brunner's glands are situated chiefly on the ^{only} duodenum. They are small papulous elevations, having ^{no} an internal orifice which ~~communicates with a central cavity~~. They are very numerous & constitute a sort of stratum. The glandula solitaria are small cavities of a papulous appearance existing in the small intestines: in their centre is a small orifice through which by pressure a fluid can be expressed. Guillot says that these descriptions are wrong. According to him these glands disappear when the mucous membr. is injected. The solitaria are the ^{consequence} product of disease. I do not however agree with him for in every body that is opened, are found Brunner's glands & the solitaria. In the lower part of the small intestine, according to Baume are found whitish elevations which are often enfolded with the solitaria. They are small

Beim apert that they are merely aggregations of
glandular epithelium they are covered with villi & a number
of clusters - according to me they are solid, & others
contain a fluid but they have no external opening -

sacculose without any external opening & contain a whitish fluid

*Peyer's glands are situated in the ileum, particularly in the
lower third or half, upon the line ^{opposite the} ~~corresponding~~ with the insertion
of the mesentery: they are generally of an oval shape & slightly
elevated above the surface of the membrane. Their uses
are unknown & their structure still undetermined.

Secondary & the German observes they have a surface
forming a patch whiter than the rest of the membrane. Seen
with the microscope, they present the form of whitest circles
surrounded with fimbriae. In man they are generally
flattened, in dogs & some other animals acuminate. ^{they are} When
compressed, no fluid exudes either from the surface or from
the fimbriae. When ruptured, they are found to contain
thick greyish fluid, interspersed with globules smaller
than those of common mucus. Baum asserts that they are the
same as the solitaria & that their greater size depends up-
on the villi surrounding them. Guillot says that they dif-
fer from the rest of the intestine on account of the greater thick-
ness of the cellular coat & villi at these points. As these two dif-
fer the true structure is still undetermined. I would rather
align with the German than the French observers - They are
frequently found in a morbid condition - ulcerated & having
their cavity open: this has led to the supposition that they are similar



to the follicles of the intestines, Brauer thinks that they are always owing to disease. In Typhoid fever they are always diseased, ^{and} ~~also~~ ^{sometimes} in ~~cholera~~ ^{cholera} ~~by~~ ^{by} ~~poison~~ ^{scarlatina} also in many other diseases. It is not to be supposed that they are essential cause of this disease, as which involves so many organs.

Epithelium - It was for a long time doubted whether the intestines were lined with an epithelium but it has been demonstrated by Keenly and others. It takes the place of the cuticle on the skin. It commences at the lips & may be traced throughout the alimentary canal becoming thinner as it recedes from the mouth. It is not continuous like the cuticle but is constituted of numerous particles placed side by side like the bricks of a pavement & presents different appearances, in different portions of the intestines body. The plastic epithelium is found on the skin consisting of several layers. In the alimentary canal it consists of small cylinders arranged like basaltic columns. These cylindrical scales have a granule in their centre & are attached by the smaller end to the mucous membrane. The appearance of this nucleus led to the supposition that the ^{villi} ~~had~~ were perforated, they being covered with these scales. In the upper portion of alimentary canal these scales are arranged in strata, the more differentiated are round, the superficial ^{become more than} flattened as they approach the surface & scale off. In some portions the epithelium is continually ^{inverted and} scaling off. At others it only peels off at particular periods. These scales constitute the mucus ejected

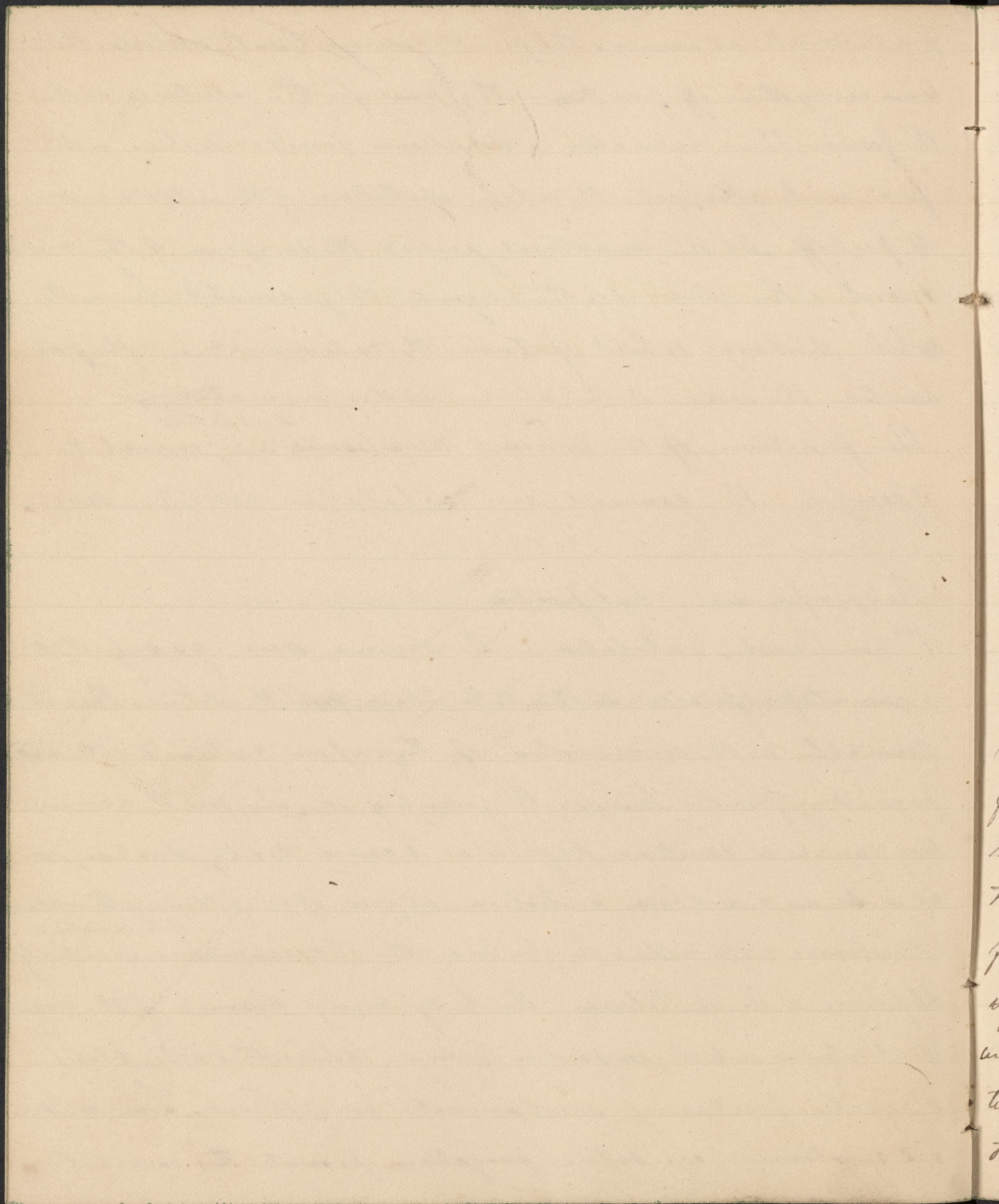
No apparatus has been discovered for the production of this respiration —

from the mouth at morning, the peculiar mucus from the nostrils: the
tears carry them off from the eyes: they pass from the intestines with
the feces - Their separation is sometimes periodical. Thus in the
first week after birth the whole epithelium of the intestines seems
to peel off. At the menstrual period the surface of the neck
& cavity of the uterus & of the vagina desquamates: hence the
white discharge which follows the catamenial. After par-
turation the surface of the uterus is desquamated.

The functions of the mucous membranes are ^{divided into} general &
specific. The general are exhalation, absorption, secretion.

The specific are chylification, digestion.

1st Gen Funct. Exhalation - The mucous mem. is subject to
a general perspiration, such as takes place from the skin. This is
obscure in the condensation of the vapour contained in the air
proceeding from the lungs. The quantity exhaled from the alimen-
tary canal is sometimes excreted & cause watery discharges
as in derms diarrhoea & cholera: at first it is filled with scales
& sometimes with villi. In cholera the muc. mem. ^{of the intestine} is entirely
deprived of its epithelium: the body being drained of the water
which entered into its composition becomes shrivelled & the blood
stagnates producing mechanical congestions. Some medic-
inal substances (eg. saline purgatives), promote this exhalation

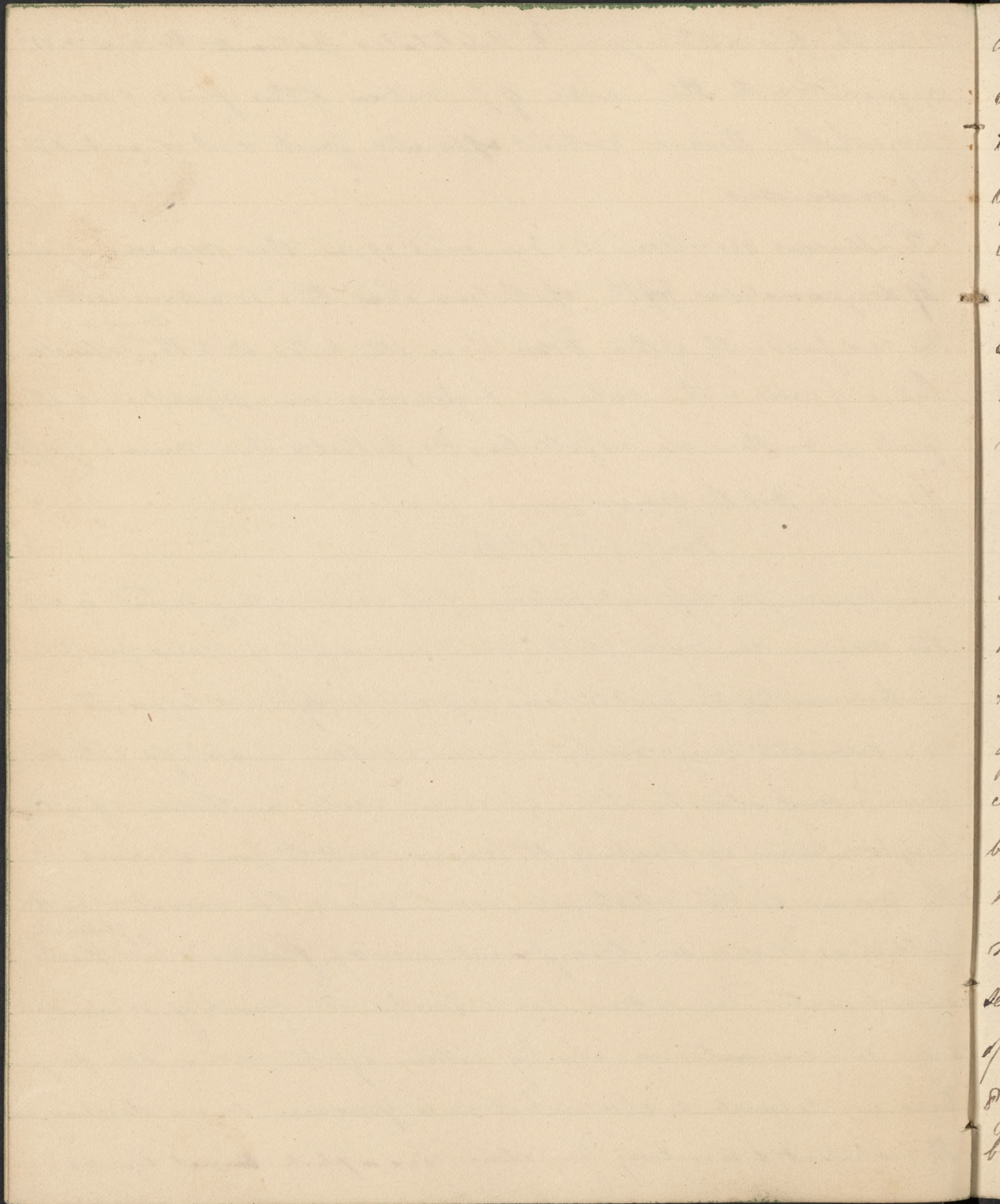


I am therefore not to be given to debilitated patients. We are not acquainted with the mode of production of this fluid & cannot say whether there is distinct apposition for it or it is exhaled by endosmosis

2^d Mucous secretion. We have said above that mucus is formed of desquamations of the epithelium: but there is a mucus secreted independently of this. Some have attributed it to the ^{mucous} follicles but is found in the antrum hyemorianum, conjunctiva & other parts when there are no follicles. It is probable that mucus of diff. parts is not the same

Jan'y 9th 1840

The mucus from different portions of the alimentary canal is not the same. The mucus from the mouth is composed of scales from the epithelium: ~~the~~ the epithelium is formed of different layers the more deep seated being somewhat cellular & composed of scale-like globular form. In some catarrhs these globular scales are thrown off. They may be obtained by scraping the tongue with the finger nail. The mucus of the intestinal canal seems to be secreted by the follicles. It is a semitransparent viscid ^{generally} fluid which floats upon in water but in some cases sinks. Its quantity is increased under some circumstances: also by certain agents such as some fergations e.g. calmel & aloes, which never procure serious discharges. The exhalant & secreting functions accomplish several objects.



In the first place they protect the membrane from the aggregation of foreign substances & remove them from its surface. Acid substances are prevented from coming into contact with the membrane by the mucus & removed by an exhalation of serum. They accomplish elimination: putrid substances effluvia inhaled & absorbed ^{by} the lungs are discharged with the mucus of the intestines which often gives off the same smell: It is in this way that putrida ethey produce diarrhoea & dysentery. They also frequently produce evacuations for the relief of certain diseases forming a crisis.

Special Functions. The mucous membrane of the alimentary canal is endowed in particular parts with a special sensibility which does not belong entirely to the nervous system. We have the sense of touch at the tip of the tongue, of taste on the tongue & fauces, of thirst in the fauces, of hunger in the stomach & a desire to evacuate the bowels at the anus. If the mucous coat of the tongue be destroyed the sense of taste will be lost. In a healthy state the sensation of hunger indicates the want of food, that of thirst the want of drink, but these may be perverted by disease. In some cases there is a constant sensation of hunger although the stomach is full, or sensation of thirst immediately after drinking. I once met with a child 8 years old who had never felt the desire to evacuate his bowels & to whom it was impossible to convey an idea of such

It is ascertained by Tiedemann & Graham that the digestive
fluid is only secreted during the process of mastication in the stomach
whether mastication or ~~the process of digestion~~
mastication and is ~~the principle~~ apart partly by pressure & is not
altered during the process of digestion - In some cases of dyspepsia
there is not mastication in the stomach too much - & I have seen
cure by giving mastication and during the process of digestion
The digestive fluid is nothing more than the solution of pepsin in
a dilute solution of mucus membrane, the can be prepared by mixing
it artificially - Place upon a piece of greenish surface of salt
water (not boiling) & add 6 or 8 drops of mastication and, the

sensation. Though clearly in other respects he frequently discharges
his forces ^{upon} his clothes. The sensation was produced by stimula-
ting the arms; but disappeared soon after. The mucous membrane is
excessively necessary for the process of deglutition. If the mucous
mem of the oesophagus be destroyed, cannot go on. I met with a
who through mistake ^{had} drank a solution of carbonate of potash
which the mucous mem was destroyed by it & he was unable
to swallow. This was sustained by fluids poured into the throat
which were however after a very short time ejected. He lived during
the summer by sucking watermelons. At one time he was
enabled for about a week or two to swallow milk & drink, sweeten
milk: but the power continued for a very short time.

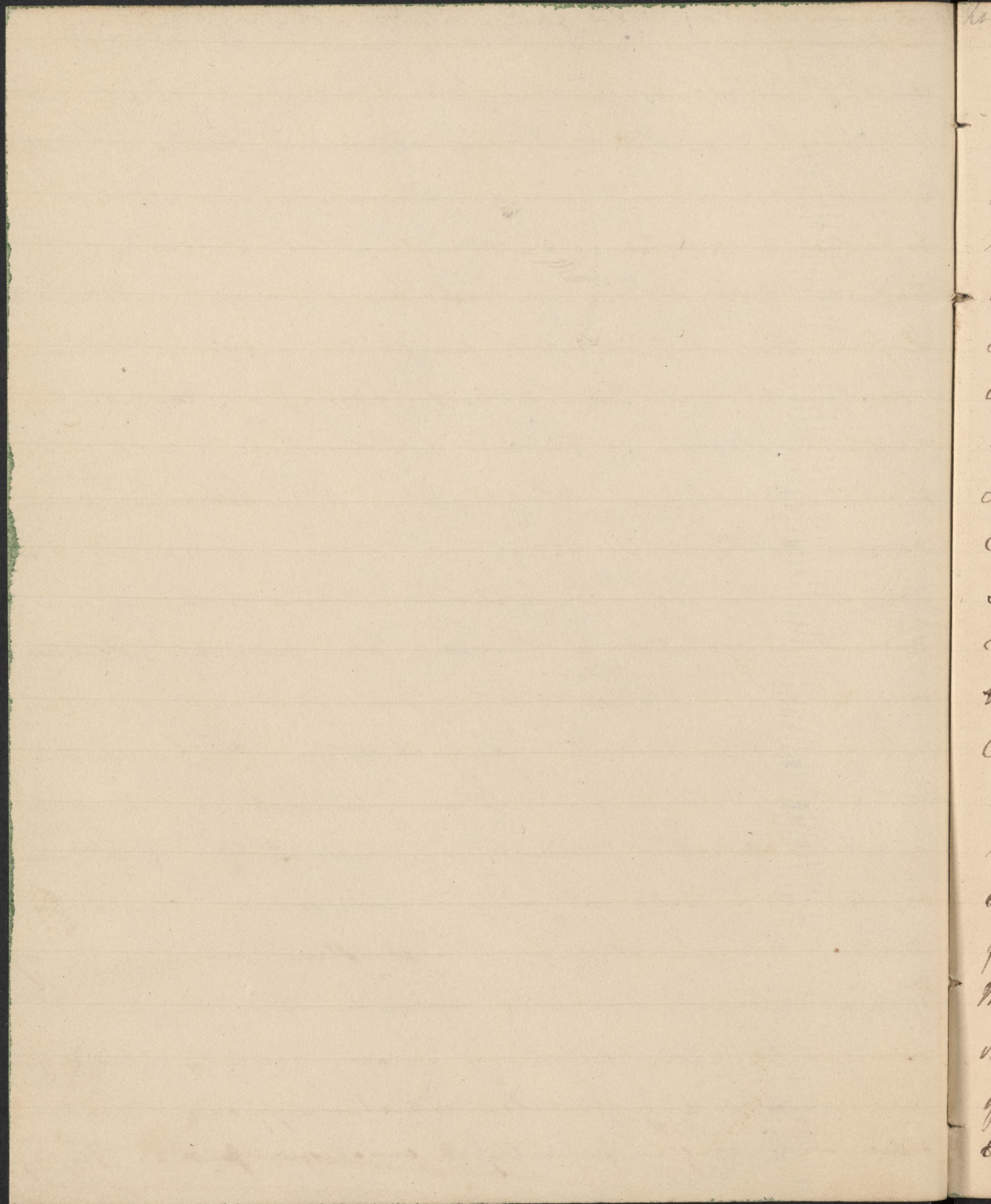
Chymification is carried on in the stomach. The chyme when
examined is found to consist 1st of globules & of effused & of fused
emulsified fibres. I discovered this some time ago & Brown & Rich-
thausen agrees with me. The chyme is always acid, Gmelin
& Tiedemann ascertained that it requires 3oz of lime to neutralize
2 oz of chyme. Its chemical composition has not been determined
& without it we cannot understand the process by which it is formed.
So far as is known, it consists of 1st Albumen & Caseine &
Osmazome & Saline. Caseine was found in the stomach of a
dog which had taken no milk & must therefore be a product
of chymification - Osmazome was found in the stomach of a horse.

I presume gastric dyspepsia can be cured by feeding
If you put a piece of meat or a boiled egg - then I will be cured
& by me - Vegetables food however is not then acted upon -
if however you add colouring vegetable to the plain corn by the
formation into saccharine matter, I think the colouring is of
more importance than Dr Beaumont supposes who supposes it
is only taken by killing the animal & mangle - Insects too eat
them, insects which live on fluids are furnished with various
apparatus -

July 23 - Pepsin is probably secreted by the tubules which empty into the
antrum of the stomach -

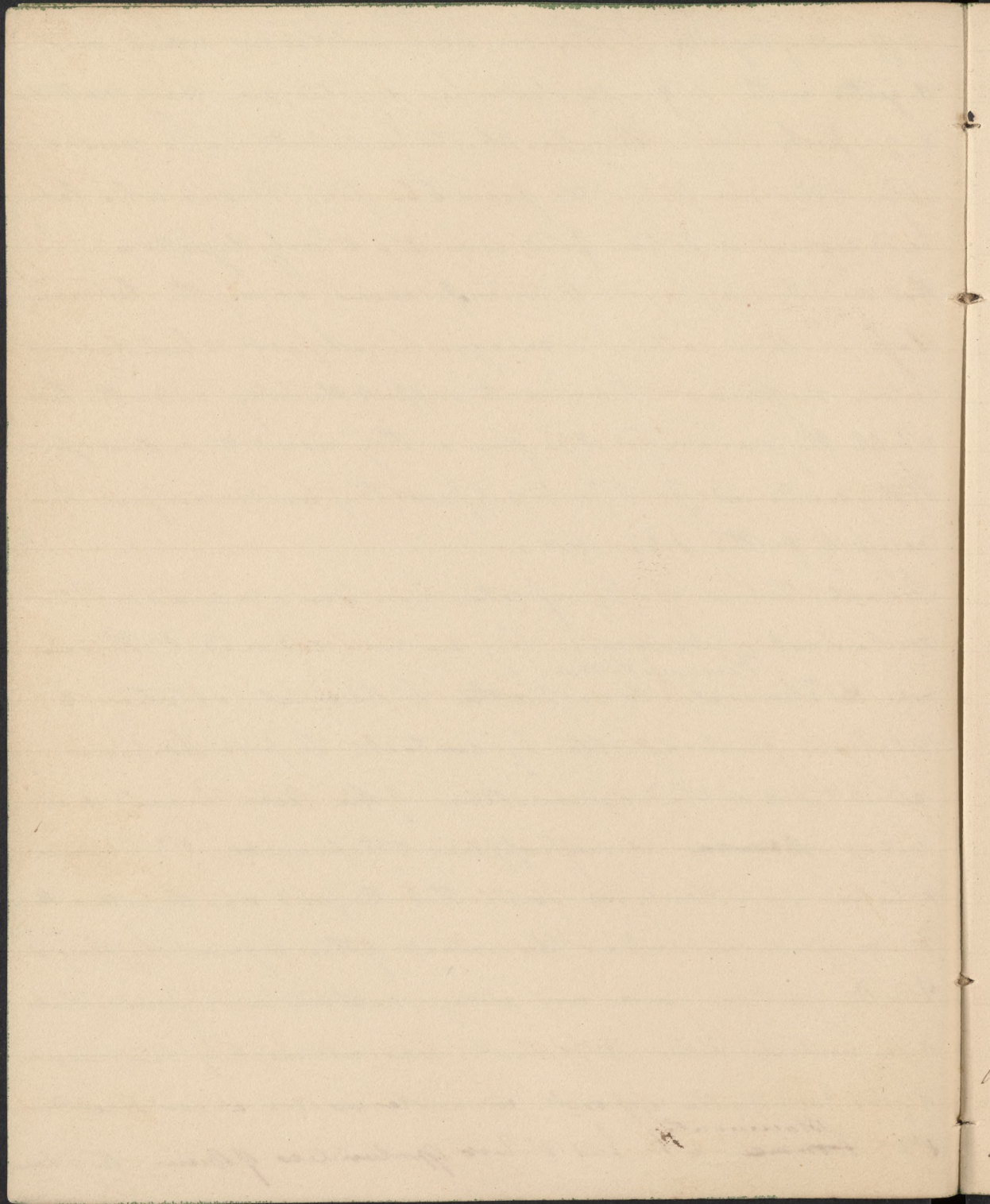
Vegetable matters consumed in the stomach first act upon the
into sugar & undergoes further change in the small intestine
In diabetes the change does not take place, the sugar is absorbed
unchanged & must be eliminated at the expense of tissues
& fibrile nutriment -

Though a diversified aliment may be, it can be reduced to three kinds 1st saccharine, embracing starch & gum 2^d oleaginous 3^d Albuminous. All aliment is made of organic matter & the different species vary only in the number of elements entering into their composition. The saccharine & ^{oleaginous} want nitrogen which enters into the composition of the albuminous. Vegetable albumen contains all the elements which enter into the composition of animal albumen & can be easily converted into it. The principal component of chyme is albumen, & the end of chymification is 1st to form a solution of albumen 2^d To convert other ~~substances~~ ^{principles} into it. The most digestible food is that which is most easily converted into albumen. The vitellus of an egg is a concentrated solution of albumen, with some oil & saline matter. This is placed at the disposal of the embryo, which is nourished by it without ^{previous} digestion. Milk which is intended for the support of young animals before they are capable of digesting common food, is an epitome of all ^{the} aliment ^{nourishing} ~~ment~~. It contains albumen, & saccharine & oleaginous matter. As a general rule, those substances are the most easy of digestion which most nearly resemble the vitellus of an egg in composition. Some substances are easy of solution, but difficult of digestion e.g. gelatin which is supposed to be nutritive & digestible & is given frequently to convalescent persons. It is very



difficult of digestion - There are some substances which are digested with difficulty: but when digested are very nutritious e.g. pork & beef. Pork should be selected as is most suitable to the necessity of the person to be fed. Persons who labour hard require nutritious food which is slowly digested. I believe that one of the chief causes of indigestion among the labouring class, is their eating a meagre breakfast which does not contain sufficient stimulus to support the body under the labour which they are obliged to perform & they resort to ardent spirits. If they would eat pork for breakfast they would not feel the necessity for this stimulus.

Several theories of chymification have been advanced - the mechanical is abandoned. They are now reduced to three viz ^{Fermentation} 1st Chemical decomposition 2nd Chemical solution 3rd Catalysis or decomposition by contact. The first has been attributed to or styled fermentation. If this term be used in its widest ~~sense~~ it may be applied to the process. 2nd Chemical solution Spallanzani found that the food was digested in the fluids of stomach without the contact of this organ. He thought that the gastric juice was always neutral - found that it was neutral when the stomach was not empty, the presence of food, but under the opposite circumstances was acid - According to ^{Braconnot} ~~Dr. Braconnot~~ who had the best opportunities of observing the phenomena

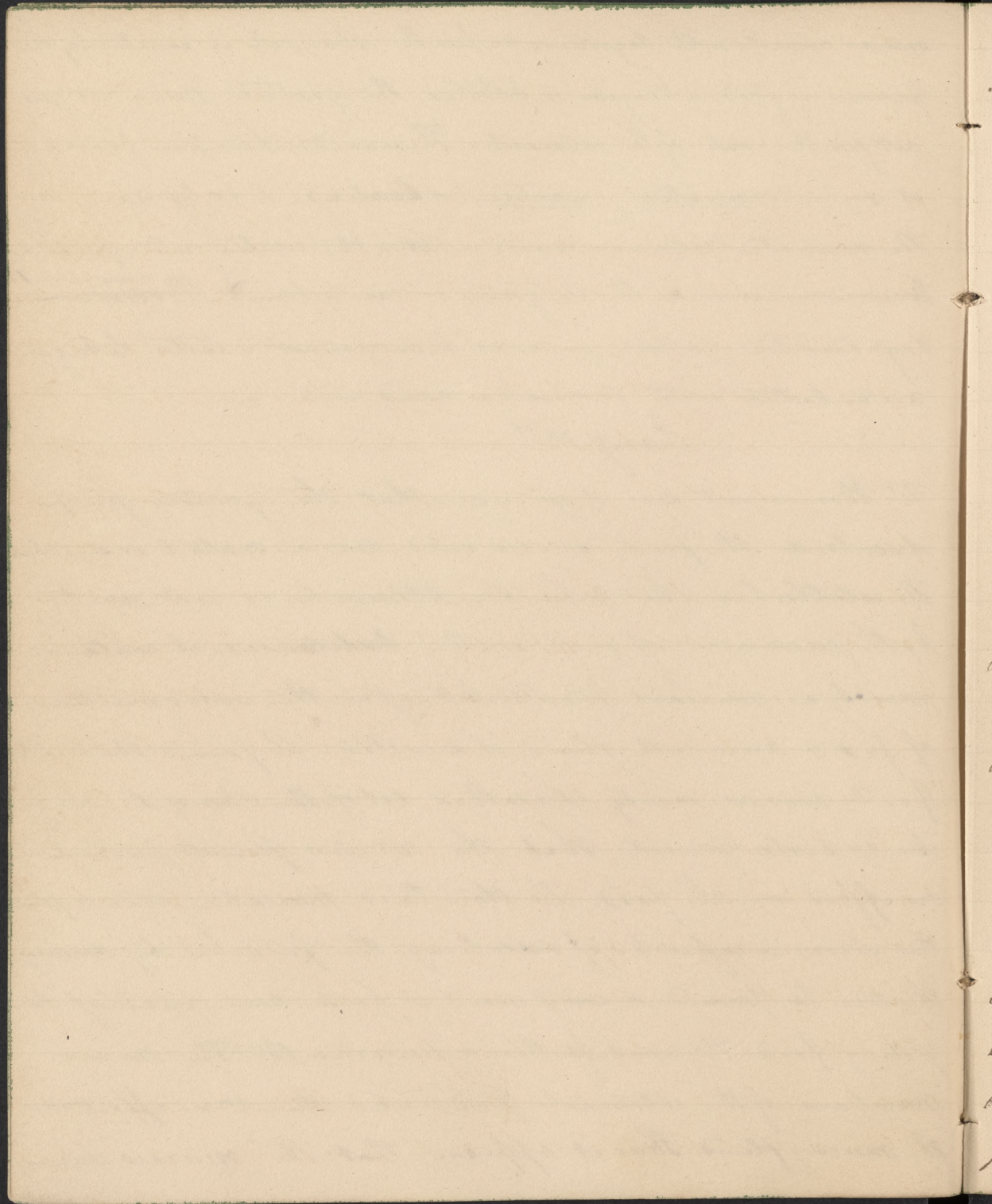


membrane connects with digestion, when the stomach is excited by the presence of food, a breeze or gobbles the gastric juice seeps out from the coat of the stomach. Three acids have been found in it viz - muratic, acetic (or lactic), & butyric

The muratic always exists in that & the acetic under particular circumstances. * The butyric is rarely found. ^{Beaumont} ~~Beaumont~~ says that the gastric juice is transparent & tastes like gum acidulated with muratic acid -

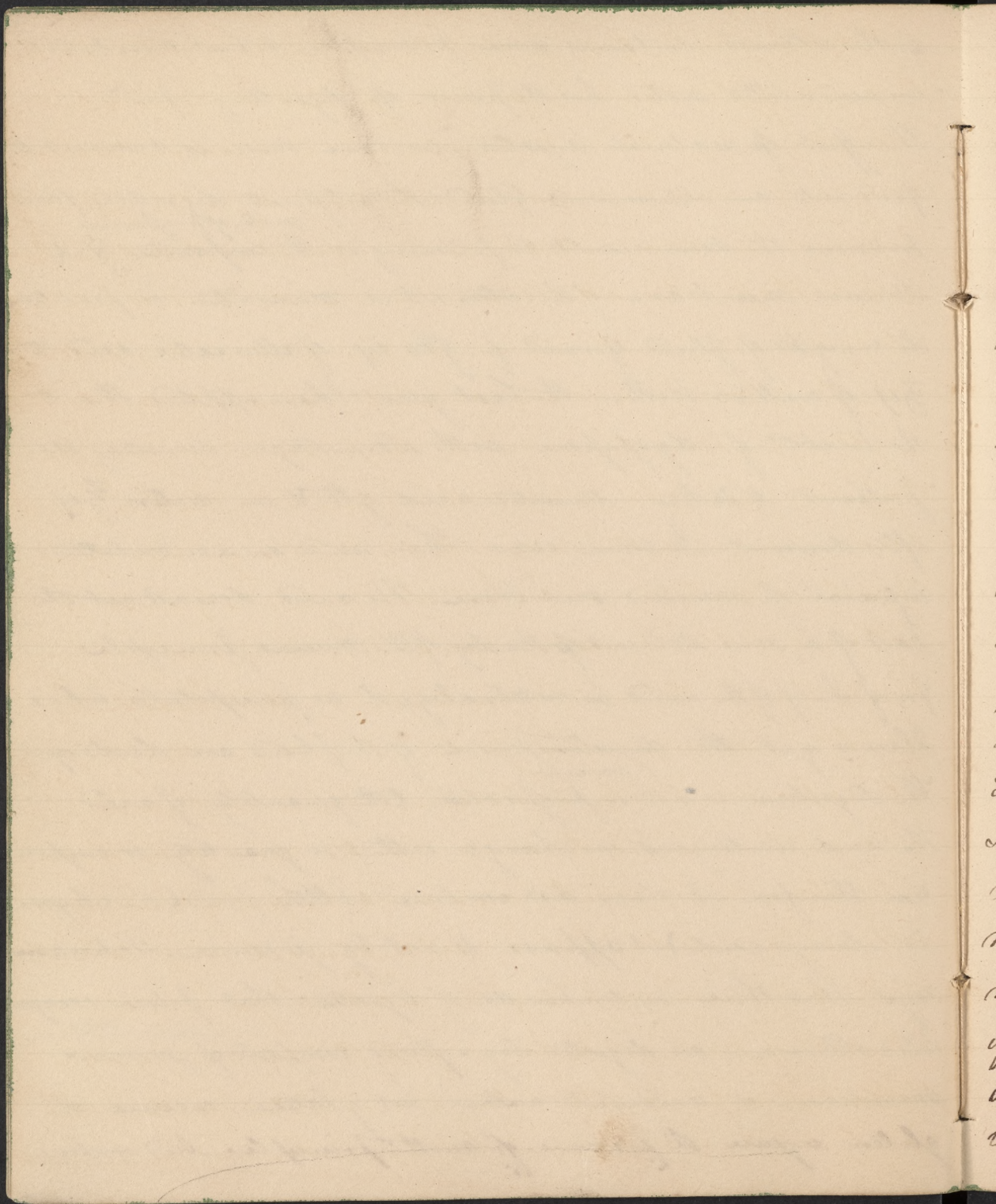
Jan'y 13th

Dr Beaumont was of opinion that the gastric juice dissolved the food as an acid does a metal or an alkali. He established that when the stomach is not excited by the presence of food or other substances, it contains merely a mucous fluid; but upon the introduction of food an acid fluid is secreted. He found that the food was as easily dissolved out of the stomach as in it. E Berle found that the mucous fluid produced no effect on the food. He then tried muratic acid & found that it was incapable of dissolving the food: but by mixing the two he formed a compound which was capable of digesting food. He went farther & discovered that the mucous membrane of the stomach produced the same effect as the mucous fluid. Thus it appears that the mucous mem-

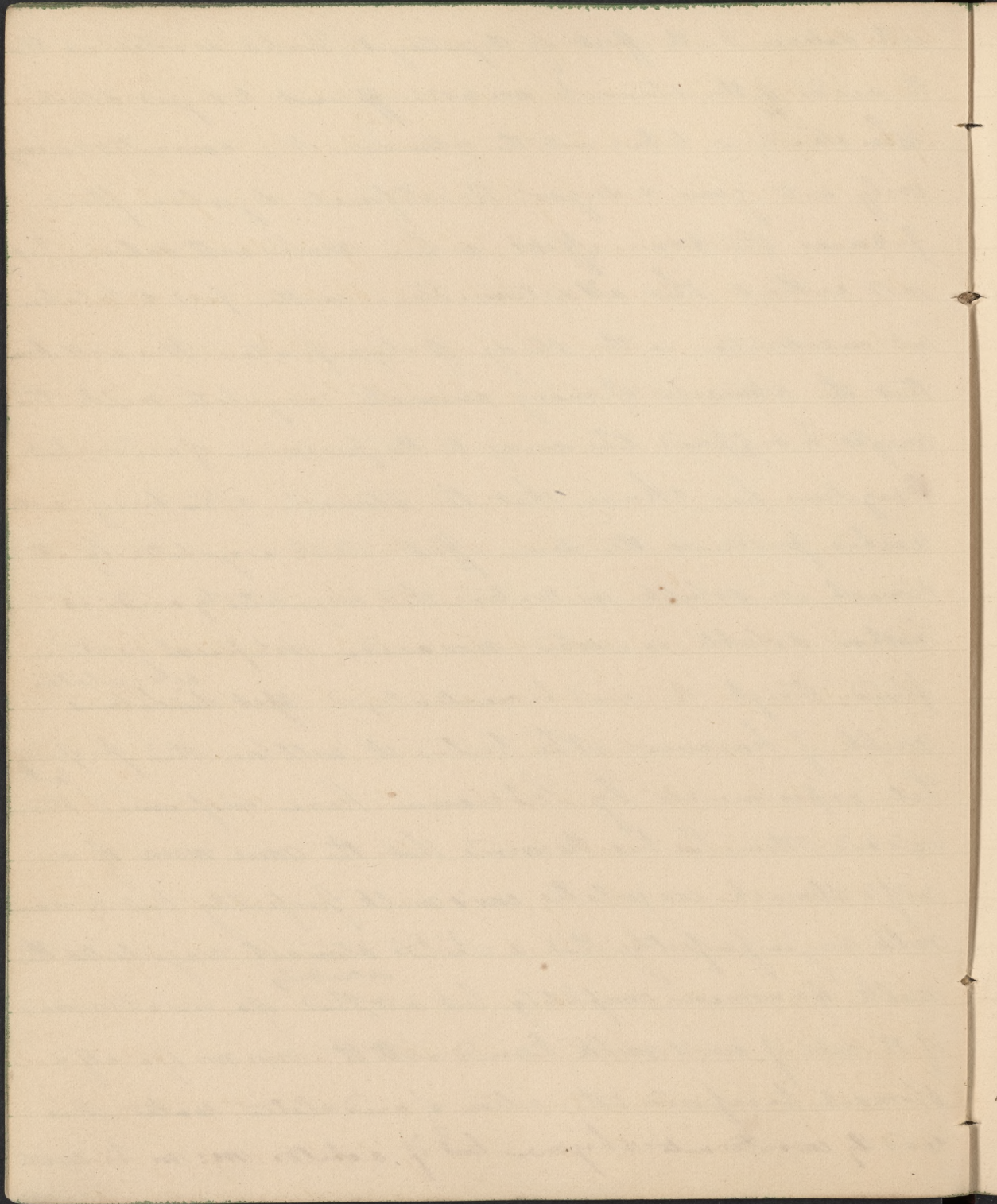


of the stomach contains some principle which dissolved in an acidulated water has the power of digesting food.

The effect of natural digestion, we have seen, is to convert the food into an albuminous fluid: the artificial digestive fluid produces the same result. The following is the ^{mode of preparing} composition of it. Mucous membrane of the stomach is macerated in few times its weight of fluid formed of gtts iij of muriatic acid to Zij of water. Within the last year I have applied this to the treatment of dyspepsia with advantage, directing the patient to take Muriatic acid gtts V in water Zij after dinner. In some cases I then used an acidulated infusion of mucous membrane. The acid does not act the part of a mere solvent, for the dog of the mucous principle. For if half of the acid be neutralized no precipitate takes place & yet the digestive ^{power} of the fluid is destroyed. The digestive is not in proportion to the quantity of acid. The acid undergoes no change either in quantity or composition: therefore it does not combine with the food & the chyme is always acid. It appears to act by presence. Schwann says that there are two kinds of digestion: that fibrin & coagulable albumen are digested by a fluid composed of ^{a secretion of the} mucous membrane & acidulated water; but gluten, casein & gluten require the presence of another principle. Acid combined

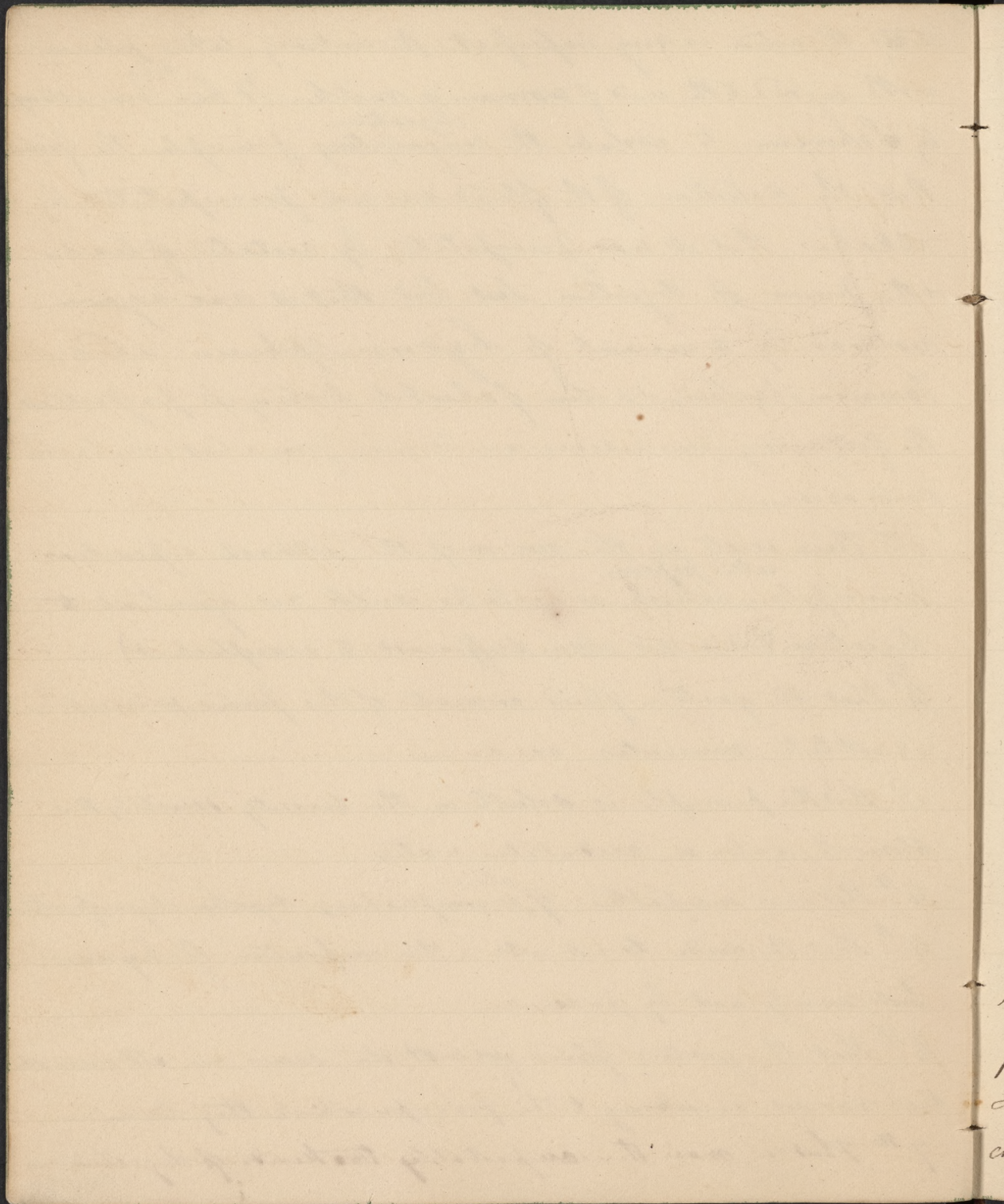


with saliva has the effect of digesting it. Looks ascertained that
the acids of the stomach are not sufficient to digest starch.
When starch is taken into the stomach it is converted success-
fully into gum & sugar. The artificial digestive fluid
produces the same effect when mixed with saliva, but
not without this addition. There is another fact to be taken
into consideration in the study of chymification. It is well known
that the stomachs of many animals coagulate milk; this
might be supposed to be owing to the presence of acids; but
Berzelius has shown that the stomach after being well
washed produces the same effect. Milk coagulated by the
stomach is soluble in water, that coagulated by acids is
neither soluble in water nor acids. Artificial gastric
fluid, though the acid be neutralized ^{coagulates} ~~effect dissolves~~
milk: if however it be boiled it will lose this property.
Late experiments by Schumann have confirmed these ^{facts}
& added to them, He has discovered that the muc. mem. of a
calf's stomach coagulates cow's milk perfectly but woman's
milk very imperfectly; that a child's stomach coagulates the
milk of a woman completely but not ^{so readily} that of a cow. Moreover
if the curd of cow's milk covered with the muc. m. of a calf's
stomach be exposed to the action of acidulated water it is
readily converted into chyme but if a child's m. m. be soluble



that the action is very imperfect. The contrary takes place with regard to the curd of woman's milk. It has ^{very} been attempted by Schwann to isolate the ~~coagulating~~ ^{digestive} principle. He found that the solution of the fluid was not precipitated by alkalis: that it was precipitated by acetate of lead & the power of digestion lost: but that it was again restored by a current of hydrosulphuric acid — Tannin, boiling & action of alcohol destroy its properties. The following conclusions are drawn from what has been said above.

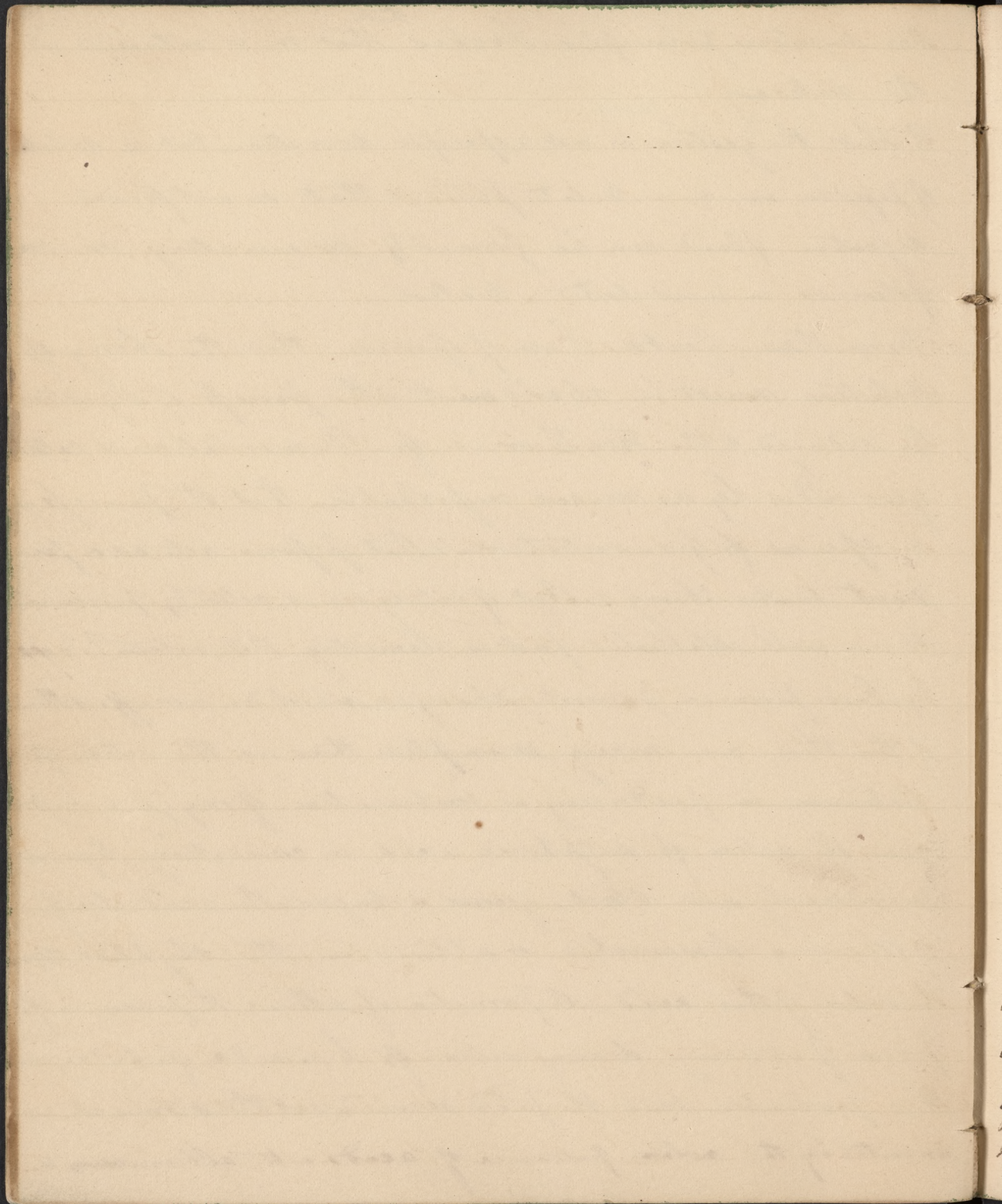
- 1st There exists in the mucous membrane of the stomach a peculiar principle, ^{called pepsin}, which coagulates milk & is essential to digestion, (but is not alone sufficient to accomplish it)
- 2^d That the gastric fluid consists of this ~~fluid~~ principle & dilute muriatic acid —
- 3^d That the principle is soluble in the serosity secreted by the stomach & also in acidulated water
- 4th That it is incapable ^{alone} of accomplishing digestion & chymification
- 5th That the acids do not enter into the composition of chyme but merely act by presence
- 6th That the gastric fluid is not the same in all animals, but varies according to the food upon which they live
- 7th That in man there are probably two kinds of digestion &



two digestive principles. Looks ^{that} one is contained in
the Salivary ^{juice}

& That the gastric is not a specific secretion; but a solution
of pepsin in an acidulated fluid: & that an artificial
digestion fluid can be formed by macerating m: m:
of stomach in acidulated water

From these facts I am of opinion that the theory of
Solubility must be abandoned & the process of digestion
be reduced to the two theories of Fermentation & Catal-
ysis. It is by no means improbable that the process is
a species of fermentation & that pepsin acts as a fer-
ment. Another theory is that of catalysis or action by pressure.
It is a well established fact in chemistry that certain bodies
by their presence promote changes which do not affect them
if they were alone. Thus as the action of
platinum in producing a combination of oxygen & hydro-
gen. the action of sulphuric acid in converting lignin
successively into starch, gum & sugar, the acid itself
not being diminished or altered in the slightest degree.
the action of this acid with formation of ether, the presence of
fibrin producing decomposition of benzoic acid of hydrogen
It is probable that the food received into the stomach is
converted by the action presence of acids into albumen &

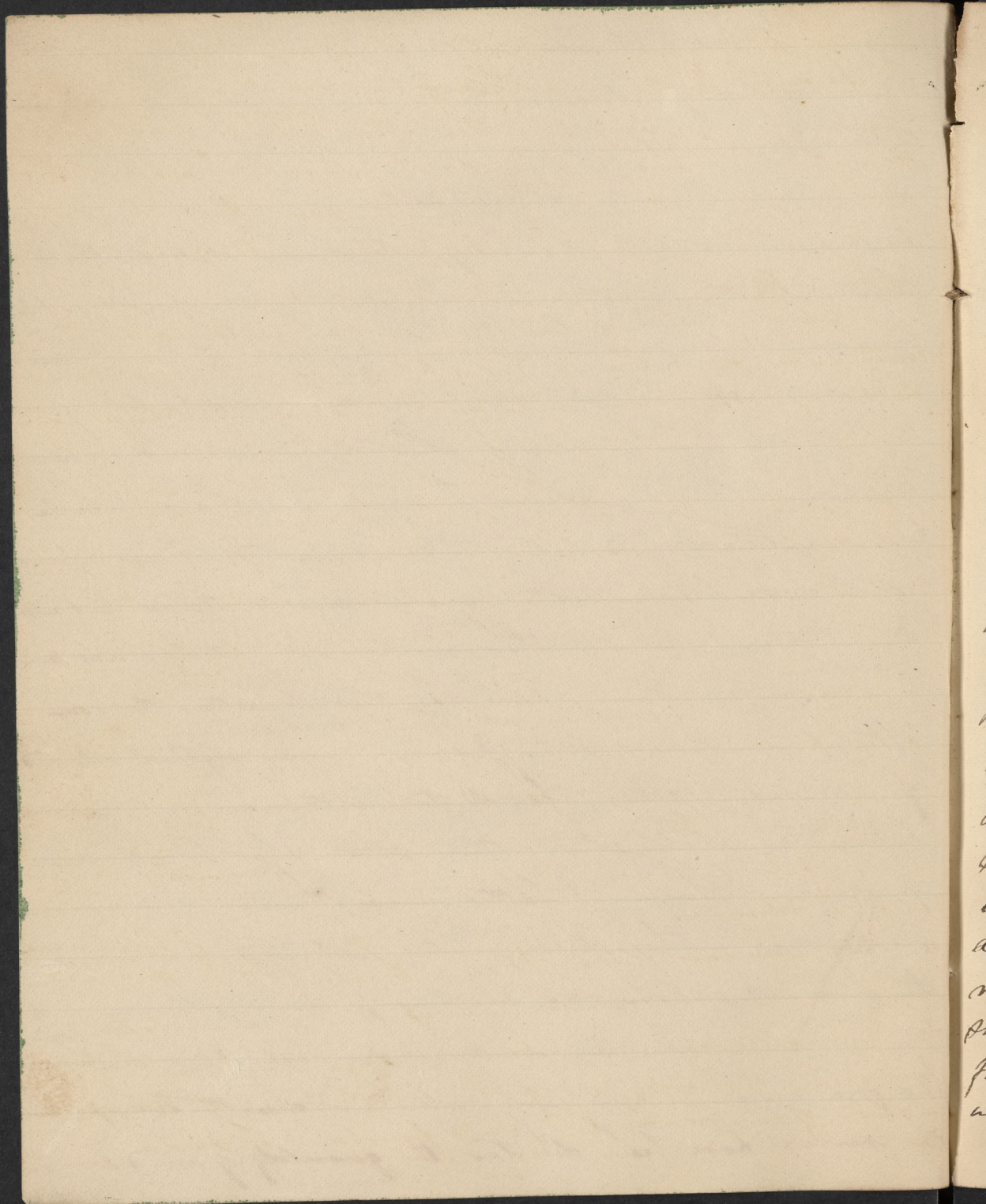


The other elements of chyme

The action of chymification is then to be referred to fermentation or catalysis -

Jan'y 14th 1840

It has been a favourite theory with many that nervous power, electric & galvanic currents have a direct influence in chymification. It was stated that ^{when} of the 8th pair of nerves was divided digestion was immediately arrested. Wilson Philip found that the process of digestion went on when the nerves were divided & a galvanic current established along the lower portion. These experiments have been repeated eighty or ninety times: but with such various results that no definite conclusions can be drawn from them. Some say that digestion goes on after the division of the para vagus without the aid of galvanism, others that it does not go on until a current is established, & others still, that it will not proceed although the latter means be used to produce it. We have seen that chymification takes place out of the stomach, altho' no electricity be applied - therefore it is not essential. We have moreover seen that the presence of a free acid is necessary. Muller asserts that when the nerves have been divided, the quantity of acid secreted



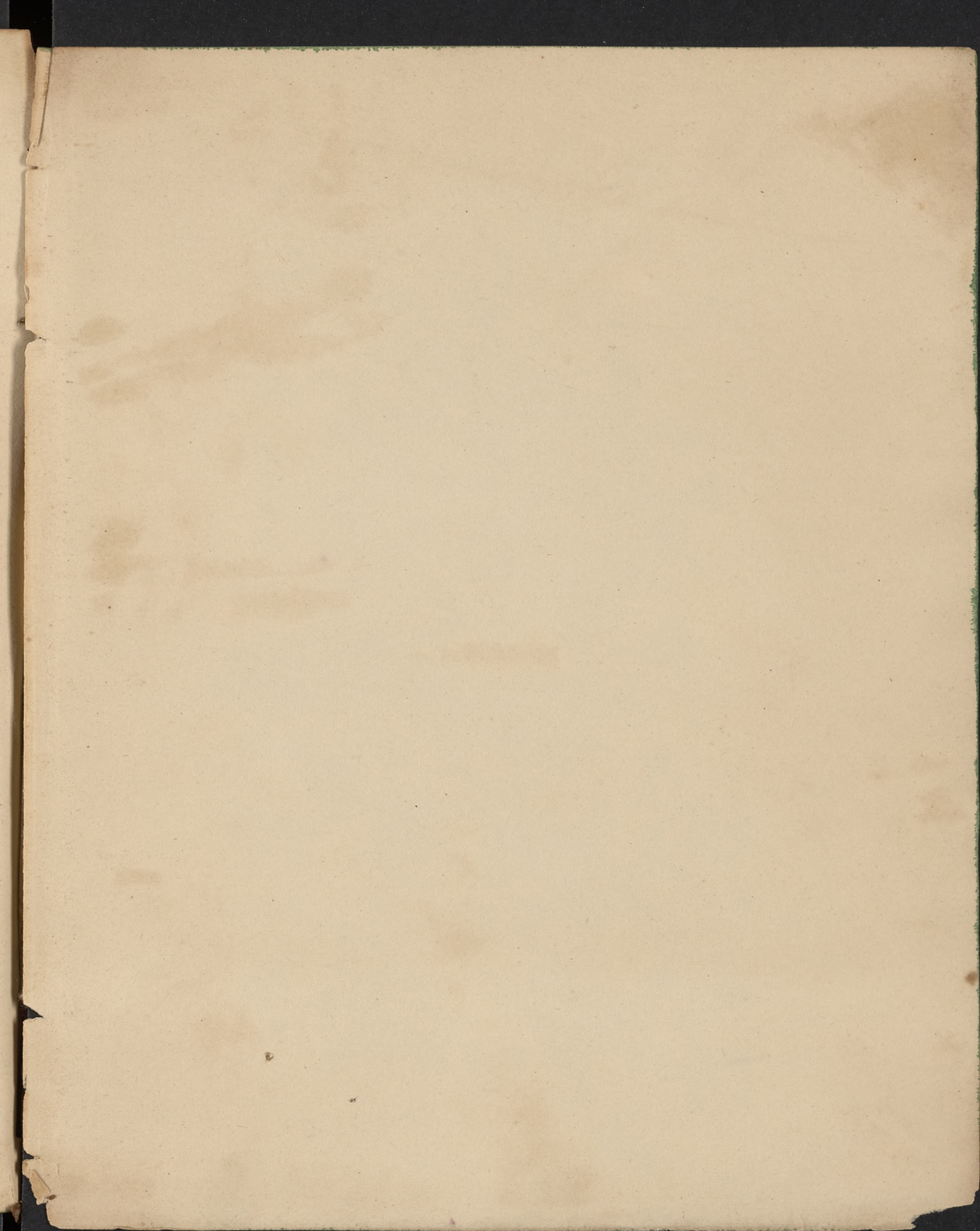
is very minute: the shock of the operation is probably a sufficient cause for the suspension of the secretion.

Berkingi has remarked that the ^{galvanic} current of galvanism through the stomach liberates the acid, & it is probable that the nervous influence produces the same effect. These experiments are the basis of many hypotheses with regard to the relation between nervous action & galvanism.

The next function of the m: m alimentary canal, that comes under our notice is Chylification - the effect produced upon the chyme in the small intestine. The chyme passes into the small intestine & is there subjected to a new action by which it is converted into ^{the} fluid from which chyle is elaborated by the lacteals. The nature of the fluid secreted by the small intestine is not established & its modus operandi of course not known. Besides the secretions from the intestines there issues a fluid from the pancreas & liver.

Tiedeman & Gmelin went into an investigation of the phenomena. First they attempted to ascertain the nature of the fluid of the intestine: ^{with} for this object they found many animals after fasting & found the intestine coated with a yellowish fluid, a very small quantity of bile being seen. When pebbles or pepper corns ^{previously} were introduced into the stomach, they found a ^{large} quantity of bile & also a very mucous fluid. It seems therefore that the bile is not thrown into the intestine unless there is an irritation of some kind. On examining horses & dogs they found ^{1st} free acid in the upper part of the intestine; in the lower portion instead of an acid they found bicarbonate of soda.

Tubule structure again appears in a column
the tubule for upper surface —



In the study of the human mind
Blair has observed the drawing of the
up to the margin, just before which you
the following

R. Quin: Sleeps go very
short & not sure of it
Last year got XXX & XXX
by sleep 4 1/2 (1/2)

Remember that certain types of disease in the
remission, the system becomes more, pulse frequent
& slightly bounding; delirium again appears. The
face is dark & the patient is very much
when the whole system is in a state of
in a few days a typhoid character appears.
Citations - a great number of cases are
to the 10 - 15 - 20 - 30 - 40 - 50 - 60 - 70 - 80 - 90 - 100
there are in the central the first
the second. And yet leading to the
the third. And yet leading to the
the fourth. And yet leading to the
the fifth. And yet leading to the

Henry P. ...

R

R

Robert ...

Henry P. ...

R



